EXHIBIT B6

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF NEW JERSEY

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IN RE: JOHNSON & JOHNSON TALCUM POWDER PRODUCTS MARKETING, SALES PRACTICES, AND PRODUCTS LIABILITY LITIGATION	:	NO. 16-2738 (FLW) (LHG)
THIS DOCUMENT RELATES TO ALL CASES	:	

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March 19, 2019

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Videotaped deposition of BENJAMIN G. NEEL, M.D., Ph.D., taken pursuant to notice, was held at Skadden Arps, Four Times Square, New York, New York, beginning at 8:56 a.m., on the above date, before Michelle L. Gray, a Registered Professional Reporter, Certified Shorthand Reporter, Certified Realtime Reporter, and Notary Public.

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I N D E X

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Testimony of:

BENJAMIN G. NEEL, M.D., Ph.D.

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E X H I B I T S

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E X H I B I T S (Cont'd.)
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E X H I B I T S (Cont'd.)
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E X H I B I T S (Cont'd.)
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E X H I B I T S (Cont'd.)
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DEPOSITION SUPPORT INDEX

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Direction to Witness Not to Answer
PAGE LINE
None.

Request for Production of Documents
PAGE LINE
None.

Stipulations
PAGE LINE
None.

Questions Marked
PAGE LINE
None.

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THE VIDEOGRAPHER: We are now on the record. My name is Henry Marte. I'm a videographer with Golkow Litigation Services.

Today's date is March 19, 2019, and the time is 8:56 a.m.

This videotaped deposition is being held at Four Times Square, New York, New York, in the matter of Talcum Powder Litigation.

The deponent today is Dr. Benjamin Neel.

All appearances are noted on the stenographic record.

Will the court reporter please administer the oath to the witness.

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... BENJAMIN G. NEEL, M.D., Ph.D., having been first duly sworn, was examined and testified as follows:

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EXAMINATION

- - -

BY DR. THOMPSON:

Q. Good morning, Dr. Neel.

A. Good morning.

Q. My name is Margaret Thompson, and I'll be taking your deposition today. Have you ever had your deposition taken before?

A. Yes.

Q. What were the circumstances?

A. In a -- in a case, the so-called Potti-Nevins case. I gave a deposition for -- in the -- for the defendant. It was a matter involving scientific fraud at Duke University.

Q. Oh. That's my alma mater.

A. And I also was deposed in a malpractice suit when I was a resident in Boston.

Q. As a defendant?

A. As a defendant.

Q. And are those the only two times --

A. Yes.

Q. -- that you've had your deposition taken?

And I assume the scientific fraud case was at least over four years ago, right?

A. It was a little over four years ago, right before the -- the deposition was taken right before I started at NYU Langone, which was January 2015. So the deposition was taken in October of 2014, so Columbus Day weekend.

Q. Okay. And you're aware that the purpose of today is for me to gain a thorough understanding of your opinions and the basis for those opinions?

A. Yes.

Q. Your report states that your opinions are given to a reasonable degree of scientific certainty.

What does that mean to you?

A. It means that I've considered all of the papers and also

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additional information that is contained in my report. And based on my more than 30 years of scientific credentials and experience in the cancer biology and cellular molecular biology field, that I have offered my opinion based on that criteria, those criteria.

Q. And how confident do you have to be in your opinions to be able to claim that it's a reasonable degree?

A. I'm quite confident in my opinions on this matter based on my 30 years of experience.

Q. Would that be 100 percent?

A. I'm 100 percent -- I wouldn't write it if I wasn't 100 percent confident in my opinions.

Q. And Dr. Neel, you are a medical doctor as well as a Ph.D. researcher, correct?

A. That's correct.

Q. Do you currently see patients?

A. No.

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Q. When did you last have a clinical practice?

A. 19 -- well I never had a private practice or an individual practice. I stopped seeing patients when I began my faculty position at Harvard Medical School in 1988.

Q. After residency?

A. Yes.

Q. In internal medicine?

A. Yes.

Q. And do you currently diagnose ovarian cancer in women?

A. No.

Q. Do you treat women with ovarian cancer?

A. No.

Q. Have you ever treated women with ovarian cancer?

A. Only in the context of my health staff training.

Q. Okay. And would that be the last time that you performed a pelvic exam --

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A. Yes.

Q. -- as well?

So let me just review some of the ground rules today to remind you. If you don't understand a question, please let me know so I can hopefully put it in a form where you do understand. Okay?

A. Okay.

Q. And I'll do my best to let you finish your answer, and probably best for you to let me finish my question too, for lots of reasons, but primarily so our court reporter can get both of our statements down without any problems. Okay?

A. Sure.

Q. And if you need a break, just let me know --

A. Okay.

Q. -- and we'll take one.

I've marked Exhibit 1 as a notice of deposition.

(Document marked for

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identification as Exhibit Neel-1.)

BY DR. THOMPSON:

Q. Have you seen this document, Dr. Neel?

A. Yes.

Q. When did you see it?

A. Yesterday.

Q. And I understand that objections have been filed. But -- and did you bring anything with you today in response to this notice of deposition?

A. No.

Q. For example, Number 3 says a copy of your complete file or files. Do you have a file related to the talcum powder litigation?

A. Only insofar as I collect the papers for my report, yes.

Q. How do you collect those?

A. On my computer.

Q. Do you have a certain location where you maintain those files?

A. Yes.

Q. And do you have any notes or highlights on the articles?
A. On the articles, no.
Q. Any notes or -- in the file where you keep your articles?
A. Only insofar as I, you know, was preparing my report. There's some notes about the text that I'm going to use in my report.
Q. Okay. I also have marked a copy of your expert report.
(Document marked for identification as Exhibit Neel-2.)
BY DR. THOMPSON:
Q. Is this the report that you were referring to that --
A. Yes.
Q. -- you kept drafts on your computer?
A. Yes.
MS. SHARKO: For the record, this is Exhibit 2?
DR. THOMPSON: This is

Exhibit 2.
MS. SHARKO: Shall we be calling these Neel-1 and 2?
MS. O'DELL: I think Michelle will write that in afterwards.
BY DR. THOMPSON:
Q. And we'll come back, of course, to that report throughout the day. So feel free to keep that close by if you'd like to.
(Document marked for identification as Exhibit Neel-3.)
BY DR. THOMPSON:
Q. And I've marked as Exhibit 3 the -- and you say that attached to your report are the references that you listed. And are those references that are actually cited or referred to in the report itself?
A. Can I -- may I look?
Q. Yes, please.
A. Yes. These references are

the references that are cited by -- in numerical order in the report.
Q. And I'm also marking Exhibit 3, which is an -- additional references that -- it's titled "Materials Considered."
And what is the list of materials considered?
A. I'm a little confused by your question. It says what they are.
Q. How does that differ from the references that are attached to your expert report?
A. Oh well, if I cited something directly in the report, it's in the references. If there were things that I was given or that I looked through, that's on materials considered.
Q. Were you -- were you given the references on the materials considered by counsel?
A. A subset of the materials were sent to me at the beginning. I made several other searches of my own and

downloaded those papers. And some of the papers I was unable to easily access from my remote location. And I asked the lawyers to have them sent to me. So some of them I got that way.
Q. Would you be able to identify which you found yourself and which you were provided to by the lawyers?
A. Not easily. I mean, I went through and I spent many hours doing this. So I'm not sure. Over time, that blurs a little.
Q. And I assume that the expert reports and deposition transcripts were provided to you, correct?
A. Yes.
Q. When was -- when were you first contacted by lawyers representing Johnson & Johnson about serving as an expert?
A. In May of 2017 I believe.
Q. And who contacted you?
A. John Winter.

Q. And what did Mr. Winter ask you to do?
A. He asked me if I would be interested in considering being an expert witness in the talc litigation.
Q. And what did you agree to do at that time?
A. I agreed to look at the materials that he gave me and make a decision subsequently.
Q. Were you asked at that time to offer any criticisms of any plaintiffs' experts?
MS. SHARKO: Well, I'm going -- I'm going to object at this point. Isn't this privileged conversations between counsel and the witness?
DR. THOMPSON: I believe what he was asked to do at the initiation is fair.
MS. SHARKO: I think that's privileged conversations between the lawyer and the witness.

DR. THOMPSON: Okay. All right.
MS. SHARKO: You can ask -- you can ask him what he did. I don't think you can ask him about discussions between the lawyer and the witness.
BY DR. THOMPSON:
Q. In that initial evaluation that you performed to look, did that include evaluating any expert reports from plaintiffs?
A. The initial -- are you talking about the initial meeting with Mr. Winter?
Q. Well, you -- you said that Mr. Winter furnished you with some literature to review, correct?
A. No. I think I said -- maybe I misspoke. But I believe I said that Mr. Winter asked me if I would be willing to look at some material, and I said yes at our initial meeting.
Q. Okay. I may have

misunderstood.
Did he -- was any of that material that he asked you to look at, did that include defense -- plaintiff expert reports?
A. At the -- the initial batch of materials that I -- that I got had no expert reports from anyone in it.
Q. Okay. Were you asked to do any experiments?
A. No.
Q. Did you offer to do any experiments?
A. No. I wouldn't be allowed.
Q. Why is that?
A. Because it would be a conflict of interest violation of my institution.
Q. What is your institution's conflict of interest policy?
A. Well, I mean, that's a pretty broad question. Do you want to maybe -- I mean, my conflict -- we have a very long policy which I have not

committed to memory.
Q. Okay. Did -- have you disclosed to your institution that you're serving as an expert for Johnson & Johnson?
A. Yes.
Q. And what details did you have to provide regarding that?
A. Just the name of the law firm that I was working with. I don't remember the name of Mr. Winter's law firm. Because I recently revised the disclosure because I'm working mostly with Ms. Sharko now which is a different firm.
Q. And why would your institution prevent you from doing any experiments?
A. I -- I can't comment on the --
MS. SHARKO: Object to the form.
THE WITNESS: I can't comment on the basis of the

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conflict of interest policy. I can only tell you what it is.
BY DR. THOMPSON:
Q. And what aspect or what language in that policy has led you to believe that you would be unable to do any experiments?
A. Because, for any kind of -- we're not allowed to take financial remuneration from anyone and at the same time do laboratory experiments on the topic. That's considered a conflict of interest as I understand the conflict of interest policy.
Q. So what -- what entities would that include?
MS. SHARKO: Object to the form.
BY DR. THOMPSON:
Q. Pharmaceutical companies?
A. Yes. If I -- if I get funding -- if I get compensation, private compensation from a pharmaceutical company, or if I own equity in a

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pharmaceutical company or founders equity, I can't do experiments in my laboratory. That's considered to be a conflict of interest at our institution. And most reputable institutions that I have experience with, and Canada.
Q. So you receive only public funding in your lab?
A. I have -- at the present time? At the present time all of my funding is public or startup funding for my institution.
Q. How about at any time?
A. When I was at Princess Margaret Cancer Centre in Toronto, which was my second job, I received a -- a grant from Novartis Pharmaceuticals to do studies related to the possible uses of SHIP2 inhibitors, which I'm an expert in, in cancer. So that was a two-year grant that had specific aims and milestones and reports that I had. And it was more like a pharmaceutical funding grant, but I was not receiving any equity in the company

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or any compensation from the company. It was not -- it was just laboratory funding.
When I was at Harvard Medical School, I believe in the third -- no, it would have been more like the fourth or fifth year that I was a faculty member, I had a grant from Roche Pharmaceuticals. That was a two-year grant, and it was a competitive grant where Harvard had a -- Harvard, I think it was the department of biochemistry -- one of the departments that I was affiliated with at Harvard, had a -- a relationship with Roche where you could submit competitive grants and then they were reviewed by a group that included Harvard faculty and Roche faculty. And they chose the ones they were interested in. And then so I believe it was a $75,000 grant that I got for two years.
Q. Okay. And --
A. And that was on SHIP1, which I'm also an expert in. I identified both

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of those molecules.
Q. Okay. And that -- and that policy goes for lab funding as well as compensation, correct?
A. Which policy?
Q. The policy that would be conflict of interest that prohibits you from doing any experiments for remuneration.
A. No. The conflict of interest policy is that I can't receive personal compensation. We are allowed to receive some -- we are allowed to pursue 20 -- we're allowed to use 20 percent of our time outside of -- of our hospital or medical school time for consulting, expert witnesses, participation in biotechnology companies. That money has to be separate from your lab money.
Q. Okay. But there would be nothing that would prevent Johnson & Johnson from providing laboratory funding for -- for research or experiments?

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A. There would, if I were receiving compensation, as I am for serving as an expert witness in this case. That would be a conflict in my -- my view of the conflict of interest policy. I didn't consult the -- the hospital about that.

Q. Okay. And does that same policy apply to anyone in your lab?

A. Yes.

Q. What did you know about talcum powder and ovarian cancer before you were approached by Mr. Winter?

A. I had seen reports in the process of litigation and, you know, that's pretty much it.

Q. And you had not reviewed any of the literature regarding the issue, correct?

A. That's correct.

Q. Did you have any opinions formed at that time?

A. No.

Q. May I assume that all of the

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opinions that you plan to give today are contained in your expert report?

MS. SHARKO: Object to the form of the question. It depends what you ask him.

THE WITNESS: Should I answer?

MS. SHARKO: Yes, you can answer.

THE WITNESS: How could I say that until I hear what you ask me? I can't answer that.

BY DR. THOMPSON:

Q. Or additional opinions that you give in response to my questions. Would that be fair?

A. Yes.

Q. Who wrote your expert report?

A. I did.

Q. Did you write every word of the expert report?

A. Yes.

Q. Did you choose the

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literature to cite?

A. Yes.

Q. And did you choose the quotes that you include in your report?

A. Yes.

Q. The references that you cited that are attached to your report, may I assume that those are the ones that you deemed most important relating to your opinions?

A. Yes.

Q. Did you perform any searches?

A. Yes. As I said earlier, I did several searches.

Q. What terms did you use?

A. Well, I can't remember all of them in detail, but certainly talc and inflammation. Talc and ovarian cancer. I don't remember all of them. But those are a couple.

Q. And what's your favorite search engine or site?

A. I use both Google and PubMed

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for different searches. I find them -- they provide different information.

Q. The -- on the materials considered, Exhibit Number 3, there are a bunch of plaintiff expert reports listed. Did you read all of those?

A. No.

Q. Can you go through and tell me which ones you did read?

A. I read Dr. Saed's report. I read Dr. Zelikoff's report. And I read Dr. Smith-Bindman's report, and I read is it Dr. -- is it Levy or Levy's report? I'm not sure how to pronounce his name. I'm sorry.

Q. Any others?

A. No.

Q. You did not look at Dr. Crowley's report?

A. No.

Q. Why not?

A. I just didn't think it relevant.

Q. Do you know what

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Dr. Crowley's report addressed?
A. I don't recall. I scanned through the intros of all of them. But I didn't think it was really relevant.
Q. Dr. Crowley's report addressed the fragrance chemicals in Johnson's Baby Powder. Was that not relevant for you?
A. No, not in my opinion.
Q. And why is that?
A. Because that wasn't the issue that I was asked to address. I was asked to address Johnson & Johnson Baby Powder studies that used the Baby Powder. So what was in them was irrelevant to the conclusion. It was just the conclusion, the effects that were relevant. And I was asked to address the issue of talc and ovarian cancer.
Q. So it doesn't matter to you what else is in the Baby Powder?
A. Not from the standpoint of experiments that involve the Baby Powder. It's just the results of the Baby Powder.

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Q. And throughout your report you refer to talc. What do you mean by that?
A. I mean talc. What do you mean by that?
Q. Well, is it Baby Powder or is it talc?
A. No -- well, it's -- the talc that I referred to is generic talc. It could be talc from chemical companies. Whatever was used in the experiments in the reports that -- and/or the studies that I read that were epidemiological based.
Q. What are the products that are at issue today in the litigation?
A. I'm not an expert on what's involved in litigation. I know that Johnson & Johnson Baby Powder and Baby Shower (sic) are involved in the litigation. I'm not aware of any other specific products that are involved.
Q. So Johnson Baby Powder and Shower to Shower are the products that we

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are talking about today, correct?
A. I don't know. That's -- I mean, I considered them for sure.
Q. Okay. When you say talc are you referring to talcum powder?
A. Yes.
Q. Are you referring to talcum powder that's platy?
A. I'm referring to the talcum powder that was used in the epidemiological studies and in the experiments of Dr. Saed and others that I considered for the purposes of my report. I can't give you an exhaustive listing of what they use. But I did consider those papers in issuing my opinion.
Q. Well, those are two different things. The epidemiology studies are typically done calling the agent that's being asked about talcum powder. And Dr. Saed's experiments were specifically done with Johnson's Baby Powder, correct?
MS. SHARKO: Object to the

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form of the question. Lacks foundation.
THE WITNESS: The epidemiological studies, in fact, were performed using a variety of different products. So there wasn't a single product used. But Johnson & Johnson products were in some of them. Some of the studies also included cornstarch.
The Saed studies, as I recall, but we have to look at them in detail to be sure, included talc from chemical companies and Johnson & Johnson products.
BY DR. THOMPSON:
Q. And we will get to Dr. Saed's work. Did you see the paper that Dr. Saed just published in the last few weeks?
A. I didn't see the final version of the paper. But I saw the accepted version that was supplied to us

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after his deposition. And I reviewed that.
Q. Why did you not look at the final published paper?
A. Because the -- as far as I know, the paper was accepted. So an accepted paper is the same as the published paper. But I'm happy to look at it if you'd like.
Q. I'm just asking you why you didn't think that was important to look at yourself.
A. Because --
MS. SHARKO: Object to the form of the question.
THE WITNESS: Because an accepted paper, in my experience, is identical to the actual paper except for minor editorial, you know, placements of figures and things like that. Once it's accepted, it's not changed.
BY DR. THOMPSON:
Q. So your opinion is that in

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the final accepted paper, there was a discussion of talcum powder other than Johnson's Baby Powder; is that right?
A. I don't recall. I'm happy to look at the paper.
Q. We'll look at that a little bit later.
And does talcum powder include fibrous talc?
A. Talcum powder includes what I just said. It's whatever was in the products that were used in the epidemiology studies and whatever was used in any of the individual papers. And I'm happy to go through any single one of them with you and review the details. But I obviously can't remember which products were used in every single epidemiology study that I reviewed and in every single paper that I reviewed, including, you know, papers from Dr. Saed and others.
Q. From a molecular standpoint, here to testify about the mechanism by

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which talcum powder may cause or contribute to ovarian cancer, doesn't it make a difference what the components of that talcum powder are?
A. No. If I am referring to the papers that are published by experts for the plaintiffs to argue for a pathogenic role, I should be considering what they use. That's the only role of an issue here in my opinion.
Q. So if it's shown that talcum powder contains fibrous talc, which is listed as a Group 1 carcinogen by IARC, that would not matter to you in your opinions as to what the mechanism might be for the carcinogenesis of Baby Powder --
MS. SHARKO: Object to the from of the --
BY DR. THOMPSON:
Q. -- correct?
MS. SHARKO: Object to the form of the question. Lacks foundation.

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THE WITNESS: Can you repeat the question, please?
BY DR. THOMPSON:
Q. So if it's shown that talcum powder contains fibrous talc, which is listed as a Group 1 carcinogen by IARC, that would not matter to you in your opinions as to what the mechanism might be, correct?
A. Yes. That's correct. Because my opinion is based on the studies that involved the application of talc, including Johnson & Johnson products, perineally, and also in some cases injected and applied to cells. And that would -- if, you know, the products have any substance in them, then they should have revealed a carcinogenic effect in those studies or they should have revealed something supporting the plaintiffs' experts arguments. But I found no evidence that that's the case. None.
Q. Are you speaking of

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epidemiological evidence?
A. I'm speaking of every -- of all of the evidence that I covered in my report. And I'm happy to go through any individual one. But it's all of the evidence that I considered in my report. I found no compelling scientific evidence to support the position that talc causes ovarian cancer.
Q. Okay. We'll get to that a little bit more later.
And you did not look at Dr. Longo's reports, correct?
A. That's correct.
Q. And for the same reason that you did not consider it relevant to your opinions?
A. Correct.
Q. And do you know what Dr. Longo's report addressed?
A. I don't recall. As I told you I scanned through each of them to decide which ones I should look at in more detail.

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Q. So you were not aware that Dr. Longo actually tested a number of Baby Powder and Shower to Shower samples from Johnson & Johnson over decades when they were produced, correct?
A. Correct.
MS. SHARKO: Object to the form of the question.
BY DR. THOMPSON:
Q. And you did not look at any of the GYN oncology reports, correct?
That would be Dr. Daniel Clarke-Pearson, Dr. Ellen Blair Smith or Dr. Judy Wolf?
A. That's correct. I -- I looked through them -- I looked at the -- at the general, you know, statements in the beginning and decided they weren't really relevant to my expertise. Therefore, I didn't look at them in detail.
Q. Did you read the expert report of Dr. David Kessler?
A. No.

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Q. Do you know who Dr. David Kessler is?
A. I don't recall.
Q. And you have listed references to various websites. What was the purpose for selecting these websites to include on your materials considered?
A. Well, there were different purposes for different websites. Do you want to walk through them one by one?
Q. No, we'll get back to some of them I think.
Did you list any websites that did identify a risk of ovarian cancer with the perineal use of talcum powder products?
A. I don't recall what's in every one of the websites, but I don't believe so.
Q. You are aware that there are websites that would list talcum powder use as a risk factor for ovarian cancer, correct?
A. I'm not aware of what

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websites that I didn't look at say. I'm aware of what websites that I did look at say.
Q. So you did not see any websites that listed talcum powder use as a risk factor; is that correct?
Or you don't know one way or the other?
A. I don't recall if I did or I didn't.
Q. And you reviewed IARC 2010, correct?
A. Correct.
Q. And what is IARC?
A. International Agency For Research and Cancer, I believe.
Q. And what is the subject matter of the monograph from 2010?
A. It covers several things. I don't remember the exact details, but we -- I can look it up.
Q. We'll come back to it.
And is it your understanding that the IARC 2010 monograph reviewed

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literature as of 2006, correct?
A. I can't recall in detail when they cut off the literature.
Q. We'll look at that.
And you are aware that the IARC monograph in 2010, published, reviewing literature up to 2006, specifically dealt with non-asbestiform talc, correct?
A. That's my recollection. But again, I read that a while ago. And I'm happy to go back and look at it with you if you want to jog my memory.
Q. That's a pretty important fact, don't you think?
A. It's not material to the question at hand as far as I can tell. Because as, again, I was asked to review the issue of, you know, Johnson & Johnson products and/or talc and ovarian cancer with respect to the evidence in the scientific literature as to its carcinogenicity, and that's what I reviewed. And whatever talc was used in

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those studies would have, you know, been the relevant talc. So that's what I reviewed.
Q. So studies that were -- would address asbestos and ovarian cancer are not relevant?
A. Not insofar as I can tell. Because I was looking at the issue of Johnson & Johnson products and/or talc as defined by the authors of the papers that used these materials, and/or the authors of the epidemiological studies that studied this issue on -- in offering my opinion.
Q. And you are talking about the epidemiological studies, correct?
A. No. I'm talking about the epidemiological studies which used certain things. And then I'm talking about the bio -- biological studies such as they are, that used various forms of talc, whether it's Johnson -- in some case it's Johnson & Johnson products directly. In other cases, talc from

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suppliers like -- chemical suppliers like Sigma.
And each study is different. But the -- the studies that I cited in my report all used various forms of "talc" and that's what I considered in offering my opinion.
Q. You'll agree that the molecular studies identified where the talc came from or the talcum powder came from, correct?
A. Yes.
Q. The epidemiological studies typically do not, correct?
A. I don't believe that that is correct. Some of them say specifically what products they are. And some of them are not as specific. So it's not a one-size-fits-all for that question.
Q. Are you aware of an epidemiological study that actually refers to what actual product was used by the women included in the study?
A. My recollection is several

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said Johnson & Johnson's products. But we'd have to go through all of the 24-case-control studies and three cohort studies that I looked at.
Q. Do you know what Johnson & Johnson's market share of Baby Powder has been over the years?
A. I have no idea.
Q. You also reviewed the IARC monograph in 2012, correct?
A. Which one is that?
Q. That's the one related to asbestos.
A. I looked at that very cursorily. I really didn't have the time to do an exhaustive study of asbestos and ovarian cancer. I looked at it cursorily. And several other papers.
Q. And even if Johnson & Johnson's Baby Powder and Shower to Shower have -- are shown to contain asbestos, that was -- reviewing that evidence and that data were not important?

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A. No, because the issue is whether there is any compelling scientific evidence that Johnson & Johnson's products, when applied perineally, give rise to an increased incidence of ovarian cancer, and/or whether there was any evidence that Johnson & Johnson products, when applied in experimental animals have any evidence of causing pre or neoplastic conditions of the ovaries or fallopian tubes.

That was the issue that I considered in issuing my report. And therefore, the issue is what's -- what the Johnson & Johnson products do, not whether asbestos is involved in ovarian cancer.

Q. Are you aware of animal studies that use Johnson & Johnson Baby Powder?

A. I would have to go back and look at the actual studies to see what was used in those studies.

Q. You don't know that?

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A. I don't remember.

Q. That wasn't something that would have been important?

A. I read through all of the animal studies, none of which show any significant carcinogenic effect of talc that was used in the studies.

Q. We'll get to those.

You reviewed the Health Canada risk assessment, correct?

A. Are we talking about the Taher, et al., paper?

Q. No, we are talking about the risk assessment published by -- draft published by Health Canada.

A. I haven't actually read the draft.

Q. Why not?

A. I haven't seen it.

Q. So you were not provided the Health Canada risk assessment?

A. I was given -- you know, yesterday, you know, the lawyers showed me briefly there was a health assessment.

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But I didn't have a chance to study it in any detail.

Q. You didn't ask --

A. In any event, it's a draft, so it hasn't been, you know, finalized. So I don't really think it's relevant until it's finalized.

Q. Well, do you know anything about the policy that Health Canada follows to publish a draft to open up for comments --

A. No.

Q. -- before it's finalized?

A. No.

Q. Did you review the conclusions of the Health Canada risk assessment draft that you were provided yesterday?

A. Not in -- I didn't have time really to review it in any significant detail. So the answer to that is no. But I'm happy to do it now.

Q. Well, you know you referred to the Health Canada risk assessment

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draft in your report?

A. No, not that I recall. Where do I refer -- I refer to the Taher, et al., paper which was the basis for the study that was being done at Health Canada.

Q. How do you know that the Taher paper was the basis for the Health Canada risk assessment?

A. I think it says it in the paper.

Q. Okay. We'll get to that when we get to that section.

And you reviewed an FDA letter in response to a citizen's petition, correct?

A. Yes.

Q. And was that provided to you by counsel?

A. Yes.

(Document marked for identification as Exhibit Neel-4.)

BY DR. THOMPSON:

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Q. I've marked as Exhibit 4 Appendix A to your report. And just tell me what this is.
A. This is a list --
MS. SHARKO: Just take your time and look through it.
THE WITNESS: This is a list of the most recent genome-wide association studies. That show genome-wide association -- that show association with specific single-nucleotide polymorphisms with increased risk of ovarian cancer.
BY DR. THOMPSON:
Q. And how does something make it to the -- this list?
A. How does it make it to this list? When there's been a -- any publication of a genome-wide association study is aggregated.
Q. And so that's when there have been enough studies published on a certain gene to reach statistical

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significance, correct?
A. Yes. Well, the statistical significance of each -- well, there's different levels of statistical significance in the GWAS for every location that's cited in the GWAS. So some of them are -- and if you go on the website and look at it, you'll see that it lists the P-value for every association.
So some of them have reached genome-wide significance, and some of them haven't. So the ones that are believed to be documented associations are those that have reached genome-wide significance. And that means that they have less than 10-8. There are other genome-wide association snips that have reached less than 10-8.
Q. And there are snips --
MS. SHARKO: Wait, wait, wait.
Are you done with your answer?

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THE WITNESS: I wasn't done.
BY DR. THOMPSON:
Q. Sorry.
A. So some of -- you know, the ones that are over 10-8 are the only ones that can be considered as documented risk SNPs.
Q. And there are new SNPs being reported all the time. You would agree with that, correct?
A. Well, the SNPs aren't being reported. The SNPs have pretty much -- you know, the SNPs that are used in the genome-wide association studies are the SNPs that are on standard panels.
What do you mean new SNPs being reported all the time? There are private SNPs between any two individuals. If I sequence you and I sequence me, we might find, you know, a new single-nucleotide polymorphism. But that's a privity SNP for you or for me. It's not one of the ones that was used to map genes.

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Q. Right. I understand that. But there is ongoing research in this area, correct?
A. Yes, there's ongoing research in genetic basis of all cancers.
(Document marked for identification as Exhibit Neel-5.)
BY DR. THOMPSON:
Q. Exhibit 5 is your CV. It appears that that was updated February 22nd, 2019, correct?
A. Yes.
Q. And you have quite a few publications, I see.
A. Not as many as I'd like.
Q. Well, you still have a lot of time, right, in your career, I hope.
How -- how many of these deal with ovarian cancer?
A. I don't know. We can go through each of them. I don't know offhand.
Q. Does eight sound about

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right?
A. I can count them. Possibly eight. But you know, cancer biology is much more broad than a specific cancer. So, I mean, my expert opinion is based on 30 years of research, actually more than 30. 30 years as a faculty member at Harvard Medical School, Princess Margaret and now NYU. And before that, you know, graduate school and Ph.D. and post-doc -- Ph.D. and post-doc training. So I've had about 36 years of -- no, 39 years of -- wow, that's a lot of time -- 39 years of research experience in this field.
From the earliest days of the cancer biology field, I was involved in, you know, some of the earliest major discoveries that led to the molecular age of cancer.
Q. And obviously that experience with other types of cancer are relevant to the study of ovarian cancer and the type -- subtypes, correct?
A. I think so, yes.

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Q. Are there any articles on your CV that relate directly to talcum powder and potential carcinogenesis?
A. No.
Q. Are there any articles on your CV that relate to asbestos?
A. No.
Q. Are there any articles on your CV that relate to particles of any kind?
A. No.
Q. Describe for me the research -- understanding it's a big lab, but generally speaking, what type of research is your lab currently doing?
A. Well, it's divided into three main areas. One area has to do with SHIP2, which we discussed -- discovered, which is a critical component of growth factor receptor, cytokine receptor, and integrin signaling pathways and is critical for the transduction of signals from activated oncogenes, such as the receptor tyrosine kinase

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amplification, certain forms of KRAS mutations, certain forms of BRAF mutations.
There's actually drugs in the clinic now that are trying to target this agent, this -- this molecule.
It's also mutated in a germ -- under a germ-line mutations in a disease called Noonan syndrome. And we've done a lot of the work on that. And there are also different germ-line mutations in the disease cause Noonan syndrome with multiple lentigines. We've done a lot of work on that. We did the first mouse models for both of those disorders.
We discovered that there's a third type of mutation in SHIP2 or PTPN11 that causes metachondromatosis, which is a rare cancer of the bone. We discovered that SHIP2 acts as tumor suppressor gene in that.
So our lab is working a lot on using -- on figuring out how to best

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deploy SHIP2 inhibitors in the -- in the clinic and how to combine them with other agents. So that's about a third.
And then we have a third of the lab that's working on ovarian cancer, pathogenesis, including studies related to the cell of origin, studies related to the heterogeneity in ovarian cancer using the single cell RNA sequencing, and various type of single cell RNA FISH.
And then we have a fourth -- sorry, a third part of the lab, which is -- oh, I forgot. I'm sorry.
And then we've also developed novel organoid systems for both the fallopian tube and the ovarian surface epithelium in the mouse. And we're using that -- those models to engineer in the specific mutations that have been found in ovarian -- human ovarian cancer so we can develop syngeneic mouse models to study how to best treat these tumors using combinations of targeted agents and

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immunotherapy, including platinum PARP inhibitors, trying to figure out how cyclin E tumors can be treated since they're not treated by platinum very well.

And then the third area of the lab has to do with another phosphatase that we discovered or that we cloned. We didn't discover it. We were the first to clone it, called PPM1 or PP1B. And we're working on how that's involved in breast cancer pathogenesis by -- and in particular how it regulates -- how -- how knocking down or inhibiting PP1B sensitizes breast cancer cells, or certain types of breast cancer cells, to hypoxia using -- and in particular, how the -- there is an interaction between this PP1B and this novel E3 ligase called RNF213, which is the disease gene for moyamoya syndrome which is a very rare syndrome that causes precocious strokes in children.

So that's the -- that's the

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major work being done in the lab.

Q. In a nutshell, right?

A. Yes.

Q. Does your lab do both in vitro and in vivo animal model research?

A. Yes.

Q. Do you do human research?

A. What do you mean by human research?

Q. Anything that requires an IRB, approval, the biomarkers in patients, anything of that sort?

A. We have -- so IRB approval is required to get issues and it's usually a pretty standard -- what they call administrative approval. So if you're counting that, yes, we have approval to get the tissues that we use to make ovarian cancer xenographs.

We have a variety -- I forgot to mention that we have a large collection of ovarian cancer xenographs in the lab that mainly came from my time in Toronto. So we have hundreds of them.

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About 50 of which are genomically characterized, and we are collaborating with people to use those.

And we are sometimes making -- we also make organoid -- we're working on organoid systems from humans. So we get tissues from our Winthrop colleagues. And that's under an IRB protocol, so -- but we don't do any clinical trials.

I'm consulting on a clinical trial that has to do with a different area of research that we transiently were involved in that's distantly related to the moyamoya syndrome thing. I don't know that you want to go into that, but I'm happy to discuss that.

Q. Probably not.

A. Has to do with -- has to do with vitamin --

MS. SHARKO: Let him finish.

THE WITNESS: Has to do with vitamin C and the connection between vitamin C and this pathway

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that I mentioned to you of PP1B and RNF213.

And we -- in reading the literature on that, I realized that there was a possible use of vitamin C in myeloid dysplastic syndrome and AML, and we got together with some of my other colleagues upstairs and did a major paper that was published in Cell last year and led to a clinical trial.

So I'm helping the junior faculty member in my department to design that trial and to execute it, which is running at the cancer center right now.

So that's the only connection. But I'm actually not on that IRB, because I'm not really doing the study.

BY DR. THOMPSON:

Q. Okay. And I -- I am not intentionally interrupting you.

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Sometimes it's hard to tell when there's a pause. Just so --
A. I have to catch my breath, you know.
Q. -- so you know that.
And the tissue samples that you use, is that something that some would refer to as ex vivo research?
A. So, you know, the use of the word ex vivo is used pretty sloppily in literature. Including some e-mails -- I actually think it's confusing when to use in vivo and not -- when to use in -- some people use in vivo to refer to mice, to mouse experiments. Some people don't.
Some people use in vivo to -- some people -- I think what we can all agree on is in vitro -- if it's a pure biochemistry experiment where there are no cells, that's in vitro.
Some people would then call putting the same, you know, testing agents on cells in vitro. Some would call it in vivo.

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And ex vivo, some people would call taking cell -- taking human cells out and doing the same kind of studies that other people call in vitro. So I can say what we do.
We -- as I told you, we make organoids, which are these culture systems that allow you to basically grow the cells in much more physiologically relevant settings involving extracellular matrix and they form glands and things like that.
We make organoids from fallopian tube, from ovarian surface epithelium of the mouse. And we have done more limited work on making fallopian tube organoids from the human.
We also have been involved in studies, some of which will come out soon in Nature Medicine, on the use -- on developing organoid conditions for culturing human ovarian cancers. And we did that in my Toronto lab, which is almost completely shut down. They are

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going to shut down completely in two months.
So if you call those ex vivo, then that's ex vivo. But it's very confusing nomenclature. So I prefer to explain what we're actually doing, and then you can judge what you want to call it.
Q. And I'm glad to know I'm not the only one that's confused, so...
A. I think it's sloppy, sloppy wording.
Q. And you have published with immortalized cell lines, correct?
A. Yes.
Q. As of most researchers in the -- that are doing in vitro research, correct?
A. Yes, but I -- the context is important. And, you know, it's like -- you use the right -- you have to -- if you want to get definitive results or interpretable results or convincing results, you have to use the right cell

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system for the right experiment at the right time. That's the point.
Q. What is contained in Johnson's Baby Powder in your mind?
A. I -- I have no knowledge as to what's in Johnson & Johnson's Baby Powder. I'm not a chemist. I'm not a, you know, material scientist, so...
Q. Do you even know what's on the bottle as to what is contained?
A. No.
Q. And that doesn't matter to you?
A. Not for the purpose of writing my report, no. Or for examining any of the studies that I referred to in my report, no. It doesn't.
Q. Okay. And -- and would you give the same answers for the Shower to Shower product?
A. Yes.
Q. And it's your understanding that Johnson & Johnson owns and manufactures Johnson's Baby Powder,

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correct?
MS. SHARKO: Object to the form of the question. Lacks foundation.
THE WITNESS: So I have no idea what the business structure is that gives rise to Johnson & Johnson's Baby Powder.
BY DR. THOMPSON:
Q. Okay.
A. All I know is that it's called Johnson & Johnson's Baby Powder.
Q. Okay. And same answer for Shower to Shower?
A. Yes.
Q. Are you familiar with the various grades of talc?
A. Not in any detail. I'm not a geologist.
Q. And same answer that that doesn't -- isn't important to you as far as your opinions go in this case?
A. No, because that wasn't what I was addressing in my report, nor what

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I'm here to tell you about.
Q. Do you know anything regarding the particle size of Johnson's Baby Powder or Shower to Shower?
A. No.
Q. Is it important for you to know the quality of a talcum powder product to assess its talc -- its health effects?
A. No, not for the purpose of my report.
Q. And would you describe quality as to the amount of and type of impurities in the talcum powder?
A. I wouldn't describe quality because I am not qualified to discuss quality.
Q. Does pure talc exist?
A. I'm not a geologist. I have no opinion on that subject. I have no knowledge in that area. I'm a cancer biologist.
Q. So if Johnson & Johnson makes claims that their talc is pure, you

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would not know whether those claims would be misleading or not, correct?
MS. SHARKO: Object to the form. Lacks foundation.
THE WITNESS: No, I wouldn't have any knowledge of that.
BY DR. THOMPSON:
Q. Is it important for you to know the mineral content of a talcum powder product?
A. Not for the purposes of my report, no.
Q. Would it be important for you to know whether there are fibers or not in a talcum powder product to assess the potential health effects?
A. Not for the purposes of my report which were to look at the specific issues that I've already covered.
Q. And that goes for the opinions that you're giving today as well?
A. Absolutely. Mm-hmm. My opinions that I'm giving today are based

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on my report and any questions that you ask me.
Q. So neither the type of fibers or the number of fibers is important in your -- in providing your opinions for us today?
A. That's correct.
Q. And you understand that this case involves women who use the Johnson & Johnson products in the genital area and subsequently developed ovarian cancer, correct?
A. I assume so. I haven't read the complaint.
Q. Okay. And when we talk about ovarian cancer generally, we're referring to epithelial ovarian cancer. Would you agree to that?
A. Who is "we"?
Q. You and I today.
A. Yeah. Sure.
Q. And I understand --
A. But I don't -- but I don't think it's meaningful to talk about

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epithelial ovarian cancer anymore. Not -- I mean, that entity is too nondescript to be meaningful from a 2019 cellular molecular biology perspective.

Q. But you understand that that is done in literature being published every single day?

A. It's not done by people who are familiar with the relevant molecular and cellular data. There's lots of papers published that aren't very good.

Q. And understanding that there are different histologic types, as well as the -- Type 1 and Type 2 being described. And the field is obviously evolving. Would you agree?

A. There were several --

Q. There were.

A. Can you make it a more specific question there?

Q. Yeah.

A. Because I don't necessarily agree with everything that you said. So if you break it down, maybe I can help

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get this.

Q. I think that's a good criticism of that question.

The study of ovarian cancer is an evolving field. Would you agree to that?

A. Yes.

Q. And in fact, just a couple years ago, National Academy of Science Medicine and Engineering, supported by CDC, sponsored a comprehensive study entitled "Evolving Paradigms in Ovarian Cancer." Are you familiar with that?

A. I remember reading it. There's lots of review and things like that. But yeah.

Q. And some of the areas that are evolving would be the cell of origin for ovarian -- epithelial ovarian cancer, correct?

A. Yes.

Q. That's one of the things that your lab is working on?

A. Yes. Although we think it's

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pretty much settled. But...

Q. But there is some debate still as far as whether that applies to some -- some ovarian cancers or all ovarian cancers?

A. Well, all cancers have a cell of origin. So I'm not clear what your question is.

Q. Bad question. We'll move on.

And there is certainly more work being done with the histologic subtypes and whether that's still a good classification system, right?

A. I don't think that there is any disagreement among modern ovarian cancer researchers at the top institutions and who are up on the literature as to the fact that it's nonmeaningful to talk about all ovarian cancer or all epithelial ovarian cancer any more than it's legitimate to talk about all breast cancer or all many different types -- lung cancer.

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They are separate molecular diseases. Cancer is not a single disease. Ovarian cancer is not a single disease. And it's simply not meaningful to talk about ovarian cancer or even epithelial ovarian cancer.

In fact, I would say -- and I would probably be going a little far, but I would probably say that it's no more meaningful to talk about ovarian cancer as an entity than it is to separate epithelial ovarian cancer from germ cell cancers. They're different cells of origin and they have different molecular defects.

Q. How about at the patient care level?

A. Well, that's one of the problems at the patient care level, is the patient care level hasn't caught up with the molecular biology. And that's the whole goal that what we're doing, because it is ridiculous, in my opinion to treat all ovarian cancer patients the

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same, and that's why we're not very good at treating it.
Q. But there is still evolution and debate in the field. Wouldn't you agree?
MS. SHARKO: Object to the form.
BY DR. THOMPSON:
Q. If we -- let's get out of the molecular researchers at an elite university and talk about medical or gynecologic oncologists. You agree that there is going to be a lag time between what you're discovering and how that new novel information gets transmitted and utilized by doctors in the field?
MR. LOCKE: Objection to form.
BY DR. THOMPSON:
Q. Correct?
A. So that's not -- I agree that there's almost always a lag between laboratory studies and implementation in the clinic. I think that that's not a

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good thing. And I should point out that I am not just a laboratory researcher, I'm the director of the Perlmutter Cancer Center at NYU Langone. And my job is to try to make sure that research, not just in my lab but in other laboratories in our institution, get translated as quickly as possible in the form of clinical trials at our institution and elsewhere.
So I think that it is true that modern information has not, you know, transmitted to many people in practice at other institutions.
But that doesn't mean that the modern information isn't correct.
Q. And I did not mean to diminish your role at all.
Do you have any understanding of how the talcum powder products are actually used by women?
A. I mean, only in the most superficial and vague sense.
Q. So no firsthand knowledge

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having talked to women about how they use talcum powder products in the perineal area?
A. I think I'd get in trouble if I had conversations with women about that. I do have experience in using talcum powder products, however.
Q. How is that?
A. When my -- I'm the oldest brother of four boys. And my younger two brothers, you know, are nine and 11 years younger than I am. And as the oldest boy, I was taught to diaper them. And we -- they used -- I used talcum powder products all the time on them. I would dust their bottoms with the talcum powder products.
Q. Would you currently dust babies with talcum powder knowing what you know?
A. I don't have any babies, so I haven't given it any thought. I don't have any reason to use it anymore.
Q. If someone asked you for

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your advice?
A. Well, my daughter is pregnant, so maybe I'll have to think about it. But I wouldn't give any advice on that. I'm not -- I'm not a medical doctor. I don't really have any -- everything is different about how diaper goes now.
We used to use all kinds of different stuff. I don't really remember the details. But, you know --
Q. So if --
A. -- I don't remember if we used talc on our girls or not.
Q. So if your daughter is pregnant knows that you're -- you've looked at this area, serving as an expert for Johnson & Johnson, and asked you if it was safe, would you recommend that she use Johnson's Baby Powder with her new baby, what would you tell her?
MR. LOCKE: Objection.
THE WITNESS: Well, my daughter is -- can I answer that?

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My daughter who is pregnant is an M.D. Ph.D. student at UCSF and she wouldn't listen to me anyway.
BY DR. THOMPSON:
Q. Well, that --
A. She's a -- she's got her own opinion. And she's got a Ph.D. in cancer biology herself so she wouldn't -- she would research it herself. So I wouldn't waste the time in telling my daughter who is a Ph.D. at UCSF, which is a better medical school than we have here.
Q. Well, that may be true.
A. It is true.
Q. But if she did ask you, what would you answer?
A. I would tell her that she should look into it herself.
Q. Okay. And would that be the same if the Baby Powder was shown to contain asbestos?
MR. LOCKE: Objection.
THE WITNESS: I don't -- as

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I said, I wouldn't give anybody an opinion on that. That's not my place to give people opinions, so it's -- I -- I don't know how to answer your question.
BY DR. THOMPSON:
Q. Well, you are giving opinions today --
A. I'm giving --
Q. -- as to what women should do, right?
MS. SHARKO: Object to the form.
THE WITNESS: No. No.
MS. SHARKO: Lacks foundation.
THE WITNESS: I'm not giving my opinion on what women should do. Women should decide for themselves what they should do.
I'm giving an opinion on whether talc or Johnson & Johnson's products, whether there's any biological

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plausibility to those agents causing ovarian cancer. That's the basis of my report. And as I understand it, that's why I am here today, to provide testimony on that basis.
BY DR. THOMPSON:
Q. And your opinion is there is no biological plausibility to Baby Powder products causing or contributing ovarian cancer in the general sense?
A. Yes. I -- that is definitely my opinion. In fact, if anything, there's evidence that it doesn't.
There's no evidence that it does. And the available evidence suggests that it doesn't.
Q. And you know that talcum powder products are no longer used on condoms or dusting diaphragms, correct?
A. I don't know that.
Q. Do you know that the FDA has banned powdered medical exam gloves or

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surgical gloves?
MS. SHARKO: Object to the form. Foundation.
THE WITNESS: I'm not an expert in regulations that the FDA might have. So I have no reason to know one way or the other, nor why they did it or didn't do it.
BY DR. THOMPSON:
Q. So in doing your research for your report, was it irrelevant that talcum powder was no longer used on exam gloves or surgical gloves?
A. No, that wasn't relevant. Because what I consider for my report was the very clear issue of what, if any, is the role of talcum powder products and/or Johnson & Johnson products that contain talc for ovarian cancer pathogenesis.
That was the basis of my report and my reading and researching related to this issue.
Q. As a physician would you agree with me that there are no -- no

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known medical benefits from the use of talcum powder products for hygiene purposes?

A. As -- as you established very early, I haven't seen a patient since 1988 so I have no comment on that as a physician. I'm not a -- I'm not a practicing physician.

Q. So you don't know one way or the other whether there are any medical benefits?

A. I'm not aware of there being any medical benefits. But I'm not in any way current on the literature of, you know, gynecology so -- or any other possible use of talc. So I wouldn't really feel comfortable giving an opinion on something that I'm not an expert on.

As opposed to the issue of whether talc causes ovarian cancer, which is right in my area of expertise and I'm quite confident in giving you an opinion on that.

Q. Would the average layperson

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know that there are no medical benefits from using Baby Powder?

A. I have no idea what the average layperson does.

As I say, I don't see patients. So I don't really have any way to assess what the average layperson's knowledge is or isn't of talc products.

Q. Would the average layperson understand that there are different molecular subtypes of ovarian cancer?

A. Almost certainly not, since I find that many gynecological oncologists don't, you know, in the community.

Q. Prior to being contacted regarding serving as an expert in this litigation, did Johnson & Johnson, or anyone for that matter, ever contact you to explore the relationship between talcum powder and ovarian cancer in your laboratory?

A. No.

Q. And over 39 years, and I

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think you told us before that you were aware of some debate or discussion regarding the safety of Baby Powder, did anyone ask you to study that issue?

MS. SHARKO: Object to the form. Lacks foundation.

THE WITNESS: No one asked me to look at this before Mr. Winter came to me.

But, you know, I want to -- I'm not going to agree with the premise of your question, because I wasn't aware of a debate.

I think I said that I was aware of reports in the press that there was litigation. That doesn't mean that there's a debate. That just means there's litigation, in my opinion.

BY DR. THOMPSON:

Q. Fair enough.

So prior to the reports in the news over the past few years, you weren't aware of any concerns about Baby

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Powder in the '70s, '80s, going forward?

A. No. I wouldn't -- no. Not -- not -- I only read about things about -- you know, regarding talc since Mr. Winter came to me in May of 2017.

Q. And you weren't -- you weren't aware of any concerns about Baby Powder or talcum powder containing asbestos?

A. I -- I read things about that in the course of doing my research on this topic. But I wasn't aware of it before.

Q. So prior to being consulted, you were not aware of any concerns --

A. Correct.

Q. -- about Baby Powder.

I think we've answered this. But other than the literature and document review, you have not done any research on the -- on talcum powder and ovarian cancer, correct?

A. Just to clarify. I did do one type of research, which is computer

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research which is in my report. And I want to make sure that I'm not misstating that.

I did, you know, for example, test the validity of some of Dr. Saed's claims by just doing simple searches on publicly available websites, some of which were the websites that were cited there. So I don't know if you count that as research. But other than that, no.

Q. Okay. Have you discussed your opinions in this case with anyone else?

A. No.

Q. You have not discussed your opinions with any colleagues?

A. None -- I mentioned that I was participating in this case, but other than that I have not discussed my opinions on this -- I probably discussed them with my wife. But that's privileged.

Q. I'm not sure it is. But

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we'll -- we'll give you a pass on that one.

A. Okay. Actually I was asked by -- last night, my -- there were people in my house, and I said I can't discuss this, so -- she told me I had to go to sleep.

Q. You told -- you mentioned that you had told -- is that colleagues that you've told that you're working on the case?

A. I had explained why I wasn't going to be here today. So -- and I had to explain why I wasn't going to be here -- why I went to the lawyers' offices several times in the last couple of weeks, so yes.

Q. Okay. Did you discuss any details as far as your opinions --

A. No.

Q. -- in the case?

Do you know Liz Swisher?

A. I don't know her personally. I know her name, yes.

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Q. I believe she participated in one of the conferences where --

A. I'm sure she did.

Q. -- you were program director?

A. I haven't met her personally. I know who she is.

Q. Okay. And does that mean that you have not discussed the case with Liz -- Dr. Swisher?

A. I have definitely not discussed the case. I don't know. So I couldn't discuss it.

Q. I understand.

You brought with you today invoices that you had submitted to Johnson & Johnson, correct?

A. I didn't bring anything with me today.

Q. Someone did.

A. Okay.

Q. But let me give you a copy of the invoice marked as Exhibit 6.

(Document marked for

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identification as Exhibit Neel-6.)

BY DR. THOMPSON:

Q. Does this appear to be -- this document appear to be invoices that you've submitted?

A. Yes.

Q. And did you prepare these invoices yourself?

A. Yes.

Q. And it looks to me that you've worked on the case about 122 hours. Does that sound about right?

A. Probably. This doesn't even include the latest invoice. So it's a little bit more. Maybe 140 hours, 150 hours, something like that.

Q. And you're billing at $750 an hour.

A. Yes.

Q. Correct?

What did you do to prepare for your deposition today?

A. What did I do? I re-read

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some of the papers. I read my report. I read some of the expert reports. And I had, as I just alluded to, several discussions with Ms. Sharko and Mr. Zellers.

Q. Did you meet -- when did you meet with the attorneys?

A. I'd have to check my calendar to get the exact dates. You know, I have so many things to keep in my head, I only try to retain the stuff that's material.

Q. Has it been in the last few days?

A. I met with them very briefly yesterday. But yes, there have been a couple of conferences.

Q. And for how long did you meet yesterday?

A. An hour and a half maybe. Maybe a little less.

Q. Let's go to your report now. I didn't see a section of your report that describes the methodology that you

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used to reach your opinions. Can you describe for me as best you can how you formulated the opinions that you gave in your report?

A. I read references that are listed in the report, consulted some additional references that I found were not material. I did the searches that I explained earlier on GWAS.org and also on the Sanger website and the CCLE website at the Broad.

And I read the other expert reports and some of their papers, and I came up with my opinions.

Q. Can you refer me to a published article or textbook chapter or treatise or anything that actually describes the methodology that you used in formulating your opinions and writing your report?

A. I don't think there is a textbook that tells scientists how to arrive at opinions.

Q. How would someone else

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that's trying to study the same issue replicate what you did to formulate their own opinions?

A. Well, the first thing they could do is go to graduate school and medical school, medical residency, postdoctoral fellowship, and have 30 years in cancer biology. That would be the background that you would need to have my opinions in this report.

And assuming that you found someone with that degree of training and expertise, they would almost certainly do exactly what I did.

Q. As you described reading the references, searching for additional references and then relying on your 39 -- is it 39 years of experience?

A. I don't know. You'd have to count it. It's very depressing for you to keep repeating that number.

Q. That is the first time I've repeated it.

A. That's the second time.

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Q. Is it the second time? Sorry about that.

A. I said it once, and that was depressing enough.

Q. I'm afraid that I have more experience -- or years than that.

But did you use the same standards in reaching the opinions in your report that you would use, for example, if you were publishing a paper?

A. Yeah, I think that's actually a good analogy. This is very similar to a type of strategy that I would use if I were writing a review article. So I've written about 37 -- or co-authored 37 review articles, or a book chapter. That's the kind of approach that I would use there. Very, very similar. I should have said that actually. That's a very good analogy.

Q. Oh, you're welcome.

Did you do a comprehensive literature review on all relevant topics?

A. I did -- as I think I would

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actually answer now the way you just helped me answer, because I think that's what -- I reviewed this to the degree of depth that I would write an article on. If I were going to write a review on ovarian cancer and talc for a scientific publication, this is the approach that I would use.

Q. Did you do any comprehensive review on fibers and particles and their role in carcinogenesis?

A. No.

Q. Did you do any literature review on asbestos?

A. Only a very limited amount of review of asbestos in the context of ovarian cancer.

Q. Did you do any review on fibrous talc?

A. Not that I recall. Only in the context of it might have been mentioned in some of the papers that I reviewed.

Q. What is fibrous talc?

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A. I can't describe. I'm not a geologist. I'm a cancer biologist.

Q. Did you use the particular method to weigh the evidence from the literature?

A. I -- it's very hard -- you know, it's very hard to describe how a scientist evaluates data. We have a lot of training in terms of looking at data and assessing its strengths and weaknesses and coming to a conclusion about that.

For example, I am an editor of six -- I'm on the editorial board of six major cancer journals. I review papers all the time. I'm reviewing a paper right now, for example, in one of the other areas, not in ovarian cancer, but one of the other areas that I mentioned earlier. And I applied the same standard to reviewing this literature that I would apply to reviewing a manuscript for Cell, Science, Nature, all of these major journals.

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So I don't know how to describe it any better than that. It's very similar to the strict approach that we would use for evaluating a new paper we got to review.

And that's the same standard that I use when writing a review article. I go to the literature, I read the papers thoroughly, I don't take the conclusions or the statements of the authors at face value. I look to see whether the data supports it -- whether the data support it, and then I reach a conclusion, and I -- I put that in the review in the context of my evaluation of the paper. And that's what I did here.

Q. So as far as weighing the evidence, would you agree that it's kind of a gestalt, based on your education and experience?

MS. SHARKO: Object to the form of the question.

THE WITNESS: Can you define gestalt? Because I know people

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use that in the common parlance. And I want to make sure we're being accurate, since it's on the record and I'm testifying.

BY DR. THOMPSON:

Q. How would -- in the way that you would define it.

A. I think it's more like what Potter Stewart said about pornography. You know it when you see it, and I know that the studies that I read on the biological plausibility of talc are bad. And I can state exactly why they're bad in multiple ways. I think I did in my report.

Q. Yeah, and I'm sure you are going to have more opportunity.

But would you say it's more subjective than objective?

A. No, I would say it's quite the contrary. It's quite objective. Bad science is very objective. People who are trained in the art can tell it.

Q. But I'm talking about the

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methodology, the objective methodology.
A. I'm trying as best I can to explain the methodology.
You read the paper, okay. You look at the data. You see if the data supports the claims. Okay. And unfortunately, in many journals, the data doesn't support the claims, even though the authors say it supports the claims.
So, you know, there is a lot of papers that are published that either overstate their data or provide evidence that is not rigorous and they still get published, because, you know, there's a paper for every journal and a journal for every paper, as my mentor once said.
Q. And that process is using your professional judgment I assume, right?
A. I think judgment is a little soft there. It's using my professional experience.
Q. Experience.
A. And -- experience and

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judgment.
Q. And judgment.
A. Yes.
Q. Okay.
A. And training. I mean, you know, I've been doing this for a while.
Q. 39 years, right?
A. See, you're just doing that to upset me. It's not fair. It's not fair to upset the witness.
Q. You know I'm going to get that in every time I can from now on.
A. I'm going to have to calculate to see if it really is 39. It might be 38.
Q. Regarding the report, do you intend to write up your opinions as to a review article in this case?
A. I hadn't thought of doing it, no. But...
Q. But you'd be willing to submit your report to -- for peer review?
A. Sure.
Q. Is that a fair assumption?

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A. Absolutely.
Q. Did you perform a Bradford Hill analysis to determine causation in this case?
A. Well, I'm not an epidemiologist. Bradford Hill criteria are epidemiological criteria. I did, you know, read -- in the course of doing my research, I did read the Bradford Hill paper, and I did address several of the issues that Bradford Hill addressed.
But, you know, as I said, my -- my expertise, as I think you know, is primarily in the area of cancer biology. And, you know, I did read the epidemiological literature from the standpoint of someone who is trained as a physician and also who is in charge of running the epidemiology and cancer control program for our cancer center grant. So I do have a little -- I have the ability to read that, but my expertise is primarily the cancer biology expertise. And that's where I -- I feel

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I have the most definitive training and expert and -- and knowledge.
Q. So I think you'd agree that you are not an epidemiologist, per se?
A. No, I'm not an epidemiologist. I think I stated that.
Q. And -- and you don't hold yourself out to be an epidemiologist --
A. No.
Q. -- correct?
Have you ever performed a Bradford Hill analysis in the course of your work as a cancer biologist?
A. No.
Q. Do you agree that scientists can look at the same body of literature and reach different conclusions?
A. Sometimes.
Q. And that's in a general sense, I'm asking that question.
A. Sometimes. But not often.
Q. So -- so credible and qualified scientists don't always agree. Would you say that's right?

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A. When they don't agree, that's because the data aren't strong enough to reach agreement. The essence of science is that it's empirical, which means that people can make the same observations in different places at different times when using the same methods. And they can, therefore, reach the same conclusion.

When scientists disagree, it's because the science is not settled.

Q. And you would agree that there are often debates in medicine and science?

A. I would answer the question the same way I just answered. That when there are debates in medicine and science, it's because the science has not established to a reasonable scientific certainty that something is or isn't true.

Q. And it's your opinion in this case regarding the relationship between the genital use of talcum powder

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and ovarian cancer, that the science is settled?

A. No. It is my opinion that there is no scientific evidence to support the contention that talc applied perineally causes ovarian cancer. There is --

Q. So the science is not settled?

MS. SHARKO: Wait, wait. Let him finish his answer.

DR. THOMPSON: You don't have to remind me every time -- when I do it, it's unintentional. And I will pause as soon as I see that he's going to continue to talk.

BY DR. THOMPSON:

Q. Go ahead, Dr. Neel.

A. There is no -- the available evidence does not support to any scientific credibility that perineal talc causes ovarian cancer. That is my opinion.

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Q. You -- I just want to make clear.

So in your opinion, the science has settled that there's no association, correct?

A. You -- you can't -- in science you can't prove a negative. So -- you can only prove a positive. And I will restate my opinion, because that's my opinion.

There is no credible scientific evidence that perineal talc causes ovarian cancer at all. There's no evidence.

Q. Leave out the credible. Is there no evidence?

A. In science there is no such thing as uncredible -- incredible evidence. There's evidence and there's bad science.

Q. Okay.

A. So if you'd like me to say that there's bad science that claims that ovarian cancer is caused by talc, I guess

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I could say that. It's bad science.

Q. And I don't want you to say anything. I just want -- want you to give what your opinions are.

A. No, there is no credible -- there is no credible scientific evidence that perineal talc causes ovarian cancer in my opinion.

DR. THOMPSON: I'm at a breakpoint if that -- if this is a good time for -- for you, Doctor?

THE WITNESS: Sure, I was just going to say. I think that would be good actually.

THE VIDEOGRAPHER: Remove your microphone. The time is 10:21 a.m. Going off the record.

(Short break.)

THE VIDEOGRAPHER: We are back on the record. The time is 10:40 a.m.

BY DR. THOMPSON:

Q. Dr. Neel, looking at your report, Page 8, you have a section that

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speaks of the hallmarks of cancer with a reference to Dr. Hanahan's paper, 2011, titled "Hallmarks of Cancer." And that's just been marked as Exhibit 8.

(Document marked for identification as Exhibit Neel-8.)

BY DR. THOMPSON:

Q. You'll agree that this is a classic paper in the field of cancer biology, wouldn't you?

A. Yeah, it's a review article, but yes.

Q. And -- right, a review article. It does -- it's not reporting primary research.

And reading in the abstract, talking about the hallmarks of cancer which include sustaining proliferative signaling, evading growth suppressors, resisting cell death, enabling replicative immortality, inducing angiogenesis, and activating invasion and metastases.

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Did I read that correctly as far as the hallmarks?

A. Yes.

Q. With some difficulty.

MS. SHARKO: Wait, wait. Where are you reading from?

THE WITNESS: She's right there.

MS. SHARKO: Oh, you are reading from the paper.

THE WITNESS: Reading from the text.

MS. SHARKO: Okay.

BY DR. THOMPSON:

Q. And then the next sentence, "Underlying these hallmarks are genome instability which generates the genetic diversity that expedites their acquisition, and inflammation, which fosters multiple hallmark functions."

Why did you not mention inflammation in your description of the cancer hallmarks as reported by Hanahan in his review article, 2011?

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A. Because the hallmarks are the things you read. As it says, underlying these hallmarks are certain things. But the reason is that -- so again, you have to distinguish between inflammation that accompanies cancer and those cancers that have a component of inflammation in their initiation. I think that's what we are talking about here.

And there is no evidence that ovarian cancer, or at least serous cancers, which is the major topic here, have inflammation as part of their, you know, initiation phase. And there's evidence against it.

Q. So it's your opinion that inflammation does not play a role in the initiation of ovarian cancer?

A. Yes.

Q. And you would --

A. In high grade serous ovarian cancer.

Q. And you would agree that

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there are certainly other cancer researchers that would disagree with that opinion, correct?

A. I don't know who specifically you're talking about. But I would -- I'm happy to go over, you know, whatever particular, you know, opinion you are talking about.

Q. So you're not aware of any scientist that would have the opinion that inflammation can play a role in the pathogenesis of epithelial ovarian cancer?

A. No, I didn't say that.

MR. LOCKE: Objection to form.

THE WITNESS: I didn't say that.

There's clearly -- am I --

MS. SHARKO: Answer. Go ahead.

THE WITNESS: She's not looking. So I assumed.

BY DR. THOMPSON:

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Q. I just wanted to make sure I asked the right question. And I think I did, so --

A. Okay. There's clearly inflammation in ovarian cancer. But that doesn't mean that inflammation is involved in the initiation of ovarian cancer, which is the issue under study here. Okay.

Q. And my question was about the initiation.

A. Okay. So in the context of high grade serous cancer, there is no compelling evidence that there is any inflammation involved in that process. If you look at -- we now know, and again this is relatively recent information.

But in the last 15 years or so, it's becoming increasingly clear that there are very well-defined pre-neoplastic lesions on the fallopian tube called STICs, which stands for serous tubular intraepithelial carcinomas -- and in serous tubal

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intraepithelial carcinomas -- and there's earlier lesions that can be seen, called STILs or p53 signatures.

And those have been studied pathologically by Malmberg, et al. and also by, you know, Dr. Shi, whose report -- expert report I did, has done an independent -- I read, has done an independent assessment.

And if you look in those lesions, there's no evidence of inflammation. So that's -- we know for sure that those lesions are pre-neoplastic.

So we have actually, since the discovery of these lesions and the underlying molecular pathogenesis that accompanies these lesions, we're able to say with quite a bit of scientific confidence that they are pre-neoplastic and in the case of STICs, the first stage in ovarian cancer.

So we actually can see snapshots of the initiation process,

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which was not possible previously.

DR. THOMPSON: Object as nonresponsive.

BY DR. THOMPSON:

Q. Because my question was, are there other scientists who would disagree that inflammation does not play a role in the pathogenesis of ovarian cancer?

A. Well, again, in the -- I don't think there's anybody who would disagree with the statement that I just made. Okay.

I think that when -- there's definitely inflammatory responses to the cancer. Okay. And cancer does play -- inflammation does play a role in the pathogenesis of ovarian cancer from the standpoint of when you have a fully developed ovarian cancer, whether there's inflammation present, and to what type of inflammation will affect clinical response and also survival.

That doesn't mean that inflammation is causal to ovarian cancer.

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And I think that's where maybe there's some confusion.

Q. Would you agree that carcinogenesis usually refers to, not only the initiation, but the promotion and progression of cancer?

A. Yes. But I think that, again, the cancer is present from the standpoint once you have a STIC. So that is a cancer.

Q. So if there were scientists that did believe that inflammation plays a role in the pathogenesis of ovarian cancer, not -- not limiting that to just the initiation, would they just be wrong?

A. I can't respond to a hypothetical question like that without seeing exactly what we're talking about. So if you want to show me the actual context of the statement, I'm happy to offer an opinion one way or the other about that. But I can't respond to a sort of, with respect, somewhat vague hypothetical about scientists of -- that

aren't specified and exactly what they said.

Q. How about other subtypes besides serous?

A. Yeah, again, the -- there are data that, for example, pelvic inflammatory disease may be involved in some forms of low grade serous cancer. But there it's not clear if it's the inflammation or the agent itself. And the recent data would suggest it's probably a specific agent there as opposed to inflammation, per se.

Q. Back to the Hanahan article, Page 658, "Emerging Hallmarks." And his paper does not deal exclusively with ovarian cancer. You'll agree, correct?

A. Correct.

Q. Under the chart, "Emerging Hallmarks," he does list -- it's a he?

A. Yeah. It's Hanahan/Weinberg. I'm sure Bob Weinberg would be very insulted if you thought that he was --

Q. Yeah, I thought so. But I -- a lot of our other papers are written by women.

And there is an emerging hallmark described as tumor-promoting inflammation. And you would agree that tumor-promoting inflammation is an emerging hallmark, correct?

A. In certain cancers, inflammation plays a very important rule. There's no evidence that that's for ovarian cancer. No compelling --

Q. But you would agree that other scientists have published that inflammation does play a role in ovarian cancer, correct?

A. Again, I'm not sure what exact publications that you're referring to and in what context. So I can't comment on a vague question like that. I need to see the actual statement.

Q. So you're not aware of any literature where it is published that inflammation plays a role in ovarian

cancer?

MS. SHARKO: Object to the form. Misstates his testimony.

THE WITNESS: Yeah, again, what I said before, was there's no question that inflammatory cells are involved in fully blown ovarian cancer.

If you look at a full -- if I take an ovarian cancer from a patient, it will have between 20 and sometimes up to 85 or 90 percent inflammatory cells.

So there's no question that the body tries to respond to the cancer with an inflammatory response. But that's not the same as saying that inflammation is involved in the pathogenesis of ovarian cancer.

For example, like inflammation is clearly involved in the pathogenesis of gastric cancer caused by H. pylori.

So you have to -- you know, you have to consider the specifics, which is why I can't comment on your, you know, question about other scientists and inflammation. I need to see the actual claim.

BY DR. THOMPSON:

Q. Okay. Are the inflammatory pathways outlined in the Hanahan study plausible?

A. Which inflammatory pathways are you talking about?

Q. The one that he describes --

A. Where -- where are you in the -- okay. So, for example, on page 664, immune inflammatory cells --

I'm sorry. I lost my microphone.

Let's -- if you go to Page 664, under the title "Immune Inflammatory Cells."

"Also, as discussed above, infiltrating cells of the immune system

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are increasingly accepted to be generic constituents of tumors." That's exactly what I said. Okay. They are generic constituents of tumors. That does not speak to the initiation event. And again these inflammatory cells operate in conflicting ways, both tumor antagonizing and tumor promoting --

MS. SHARKO: You have to read a little slower.

THE WITNESS: Oh, I'm sorry. I switch into fast mode when I'm reading.

MS. SHARKO: That's okay.

THE WITNESS: "These inflammatory cells operate in conflicting ways. Both tumor-antagonizing and tumor-promoting leukocytes can be found in various proportions, if not in most, all neoplastic lesions."

So that's -- that's exactly what I said before. The cancer --

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there is no question that when you have a cancer developing, that the cell -- the body tries to respond to it usually. And depending on the nature of the response, that response can antagonize the tumor or it can help the tumor, because the tumor adapts ways to respond to it in a positive way.

BY DR. THOMPSON:

Q. And --

A. But that's not initiation.

Q. Yeah, that wasn't my question either.

A. Okay.

Q. But you will agree that in using this review article to describe the hall -- hallmarks of cancer, and it wasn't a specific discussion of ovarian, it was a discussion of all cancers, you left out the -- several places in the Hanahan report where the authors discuss inflammation and its role in cancer, correct?

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A. No. Again, this was a general --

Q. That's a yes-no question. You left that out of your report, right?

A. I didn't discuss it in that -- in that particular place in my report.

Q. Okay. Let's go to another general cancer article.

You are familiar with Dr. Balkwill I'm sure?

A. Yes.

Q. And Dr. Balkwill, I think, was a featured speaker at one of your conferences --

A. I know Fran personally.

Q. -- and you know her.

A. Yes.

Q. Do you respect her as a credible scientist?

A. Yes.

DR. THOMPSON: I'm going to mark Dr. Balkwill's review article.

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(Document marked for identification as Exhibit Neel-9.)

MS. SHARKO: Do we have an Exhibit 7? This is Exhibit 9, right?

MR. ZELLERS: Yes, it should be 9. The last one was 8.

(Whereupon, a discussion was held off the record.)

DR. THOMPSON: I don't have a 7 sticker. But we'll -- we'll figure that out at the break.

BY DR. THOMPSON:

Q. Are you familiar with this article --

A. Yes.

Q. -- titled, "Inflammation and cancer: Back to Virchow?"

A. Yes. Virchow.

Q. Virchow, sorry.

And this article, reading from the abstract again, "Reviews the links between cancer and inflammation and

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discusses the implication of these links for cancer prevention and treatment. We suggest that the inflammatory cells and cytokines found in tumors are more likely to contribute to tumor growth, progression, and immunosuppression than they are to mount an effective host anti-tumor response. Moreover cancer susceptibility and severity may be associated with functional polymorphisms of inflammatory cytokine genes, and deletion or inhibition of inflammatory cytokines inhibits development of experimental cancer.

"If genetic damage is the 'match that lights the fire' of cancer, some types of inflammation may provide the 'fuel that feeds the flames.'"

Would you agree with that statement that Dr. Balkwill made in this review article?

A. Which statement? There's a number of statements there.

Would I agree with all of

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it?

Q. Would you agree with all of that?

A. Insofar as it generally says what's true in cancer in general, yes. Insofar as it refers to specific issues that are raised in my report and in my testimony thus far, not completely.

And I would also note that this paper is from 2001 which basically makes it ancient history.

Q. And if you --

A. Just so you -- can I just complete that?

There's been more learned about ovarian cancer in the last ten years than in all of reported history before then. So really, citing papers from 2001 are really not relevant to current ovarian cancer pathogenesis or what our knowledge is of current ovarian cancer pathogenesis.

Q. Looking at the chart, Panel 1, some associations between

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inflammation and cancer risk.

Cancer risk would be the cause or the initiation of cancer, right?

A. I'm not sure what she meant there. But generally that's true.

Q. You wouldn't refer to risk of -- when you have a cancer that's already there, would you?

A. No, definitely not.

Q. And doctor --

A. But actually in the -- can I finish my statement?

But in the context of the fact that cancer is a genetic disease and the genetic damage that causes cancer is what lights the fire, I think she's actually said that this is not involved in cancer initiation because this fuels the flames.

So if you use her own language, I think it supports my position on this subject which has actually developed much more since 2001.

Q. And I'm looking at

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Panel 1 --

A. Yes.

Q. -- some associations between inflammation and cancer risk.

A. Mm-hmm.

Q. And it does list ovarian --

A. Yes, it does.

Q. -- correct, in this chart?

A. Mm-hmm.

Q. And the inflammatory stimulus or condition is listed as pelvic inflammatory disease, talc, tissue remodeling.

A. Mm-hmm.

Q. Is Dr. Balkwill wrong about that?

A. Yes. She is incorrect according to modern knowledge, yes, on those details.

Q. Despite --

A. The tissue remodeling is probably correct. The other two are unclear. More recent evidence does suggest a possible connection with pelvic

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inflammatory disease, as I already said. But that's very -- very recent, hasn't been firmly established yet.

And, in fact, the conclusions of the articles that -- that discuss the risk of pelvic inflammatory disease state that more research is -- is needed.

And I'm actually quite interested in the recent abstract that was at last year's ACR, I want to see if the paper comes out on Chlamydia trachomata and serous cancers, because that would actually be quite interesting as it would tie ovarian cancer pathogenesis to a specific agent, which has not been done before.

Q. And -- and --

A. There is increasing evidence that specific infectious agents are actually relevant in various cancers. So that would be interesting.

The talc data was quite immature in 2001 so I don't really think

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it's even relevant to discuss it at this point. I think that we've had many -- much more data since then. And that the same data was available to IARC in 2010 and they found it not, you know, compelling.

Q. And IARC 2010 reviewing literature up to 2006 specifically dealt with non-asbestiform talc, correct?

A. The same talc that Dr. Balkwill lists in this paper.

Q. How do you know what talc she is referring to?

A. Well, she just says talc which is, you know, basically -- if we look at the paper I'm sure we can find the citations to the same papers that IARC considered.

Q. But you've -- you've already testified that when you use talc, you're referring to talcum powder products; whereas, IARC was specific about non-asbestiform talc, correct?

MR. LOCKE: Objection to

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form.

THE WITNESS: So there's two questions there. Can we break them in half?

You said I've already testified as to this.

What I testified to is that I considered whatever was defined as talc in the papers that I read. And in some cases, specific talc was defined as Johnson & Johnson talc.

In others, it was just generic talc. In still others it was defined as, for example, talc from Sigma.

We'd have to go through every single paper to see what talc was used in the particular study. Some of the studies also used a mixture -- not a mixture, but they combined perineal powders to include cornstarch. So each paper is different, okay? We

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can't lump them together.

BY DR. THOMPSON:

Q. Okay.

A. What was the second half of the question? Because I didn't catch that.

Q. Let's go on. Have you talked to Dr. Balkwill about the opinions regarding talc in this paper?

A. No. As I told you, I haven't spoken to anybody about my opinions in this case.

Q. Did you review this paper when you were looking at the subject of talc and its relationship to ovarian cancer?

A. I did scan through this paper. That's -- I'm familiar with this paper anyway. But as I said, it's from 2001. 2001 really is like, it's like ancient history in cancer biology. I know that sounds crazy, but it really is.

Q. You would agree that our plaintiffs in this case, most of which

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were using talcum powder throughout decades, but certainly were using it in 2001, correct?
A. I don't know what your -- I don't know your specific plaintiffs, except that I know that they had ovarian cancer, for which I'm very sorry.
Q. So when this paper came out in 2001 stating that there was some association between inflammation and cancer risk, listing ovarian as the malignancy that it applied to and talc as an inflammatory stimulus and condition, would that have caused anyone concern in 2001?
MR. LOCKE: Objection.
MS. SHARKO: Object to the form.
THE WITNESS: Who is "anyone"?
BY DR. THOMPSON:
Q. Would that have caused you concern about whether talc should be used by women in the genital region in 2001

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when this paper was published?
A. So -- okay, if I were involved in regulation in 2001, I would have done exactly what I did in this case, which was to review the literature available at the time. And I would have found it wanting and not compelling, as IARC did in 2010, when they reviewed the literature that it was up to 2006, which obviously included this paper in 2001.
So I think that the fact that it's stated in this paper as an association, does not mean that Dr. Balkwill did an extensive review of the literature, as I did.
And, therefore, I really doubt that if Fran Balkwill were sitting right here, she would say otherwise.
Q. That's pure speculation, correct?
A. Okay. Yes.
Q. You don't know what kind of review she did?
A. Well, I do know that I

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reviewed all of the literature in this area.
Q. I asked what she did.
A. I don't know what she did. But we can look at her citations.
Q. Have you spoken to Dr. Balkwill about her opinions in this paper?
A. No. I said that I hadn't.
Q. And when was the last time that you spoke to her?
A. The last time I saw Fran was probably 2015, maybe. I don't know for sure though. I saw her at a meeting.
Q. Are you familiar with Simone Reuter?
A. Well, I don't know. I have to see the spelling. Maybe I am and it's just not pronounced correctly.
(Document marked for identification as Exhibit Neel-10.)
BY DR. THOMPSON:
Q. And this is another review

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article that will be Exhibit 10. Have you seen this article before?
A. I don't think so. But I know these authors.
Q. Okay. And are they credible researchers scientists in your opinion?
A. No.
Q. And what led you to make that conclusion?
A. I've reviewed some papers by the senior author and I find them to be very poor.
Q. These authors are at M.D. Anderson Cancer Center in Houston, correct?
A. I don't know if they're still there. But yes. This is --
Q. That's where they wrote this paper?
A. -- from 2010.
Q. And M.D. Anderson certainly has a good reputation as a cancer center, correct?
A. Well, I actually

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participated in external reviews of various programs at M.D. Anderson. And I find some of the scientists are good and some of them are not very good. And I've written that, and knowing -- we participate in a review of one of the departments there. So I'm pretty familiar with the science at M.D. Anderson.

It's a gigantic institution, and the quality of the research varies from laboratory to laboratory.

Q. Okay. And this article is titled, from 2010, "Oxidative Stress, Inflammation, and Cancer: How Are They Linked?"

And in the abstract, the authors state, "How oxidative stress activates inflammatory pathways leading to transformation of a normal cell to tumor cell, tumor cell survival, proliferation, chemo resistance, radioresistance, invasion, angiogenesis, and stem cell survival is the focus of

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this review."

Would you agree that those events, starting with inflammatory pathways leading to, are hallmarks of carcinogenesis?

A. I think that as I said before, in some cancers chronic inflammation is definitely part of the initiation event.

This paper is from 2010. And it is generically talking about pathways that are involved in cancer. It has no specific relevance to ovarian cancer. And in fact, as I said before, the evidence today in 2019, which is a lifetime ago from 2010 in cancer biology, directly assesses this with knowledge of the premalignant lesions and looking at the premalignant lesions and finding no inflammation.

Q. At what point in time can we consider an article that relates to ovarian cancer as relevant?

A. It depends on -- it depends

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on the specific topic. Different things are developing at different times. So the genomics, for example, the genetic changes occurring, I would say largely defined in the beginning of 2012.

The evidence showing cell of origin is still somewhat emerging. It depends on the specific details.

Q. So any theory or any -- scratch that.

Any mechanism that describes oxidative stress and inflammation as relevant to the pathogenesis of epithelial ovarian cancer is irrelevant?

A. No, I didn't say that. First of all, I think that you're conflating several things. Oxidative stress is separate from inflammation. They can be linked, they can be separate. We'd have to talk about each one of them separately.

In terms of oxidative stress, the oxidative stress in most cases that's associated with cancer

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pathogenesis is coming from endogenous reactive oxygen formation that's catalyzed by cellular respiration through mitochondria and the uncoupling reactions that occur there.

Q. And any scientist who disagrees with that is wrong?

A. With what?

Q. What you just said?

A. Which part? That oxidative stress and inflammation are intellectively linked?

Q. That it's coming from -- catalyzed by cellular rest through mitochondria --

A. Respiration.

Q. Respiration.

-- and not from exogenous or extrinsic factors.

A. It depends --

MS. SHARKO: Wait, wait. What is the question?

BY DR. THOMPSON:

Q. That the cancer would be

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coming from mitochondrial respiration -- endogenous mitochondrial respiration and not extrinsic factors.

A. It depends on the specific cancer and it depends on the specific context.

For example, in the case of H pylori induced gastric cancer, the H pylori provokes inflammation, and the inflammation results in the immigration of immune cells and they may contribute to oxidative stress by producing reactive oxygen species.

But in many cancers, the reactive oxygen is coming from endogenous respiration, and one of the theories for obesity and causing cancer goes through that.

In the case of ovarian cancer, there may be -- there is evidence that is still emerging about whether follicular fluid has reactive oxygen species in it, and that may contribute to the incessant ovulation hypothesis.

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Q. Okay. I didn't ask about H pylori or follicular fluid.

A. Well, you asked about cancer.

MS. SHARKO: You don't need to respond to that. She's going to ask you another question.

BY DR. THOMPSON:

Q. These authors state, "Overall, observations to date suggest that oxidative stress, chronic inflammation, and cancer are closely linked."

Do you agree or disagree with that statement?

A. I think that it depends on the context and that that -- a general statement like that is not necessarily correct for any individual cancer.

Q. Well, the context is in a review article about cancer in general.

"Overall, observations to date suggest that oxidative stress, chronic inflammation, and cancer are

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closely linked."

Do you agree or disagree with that statement?

A. I agree with that for some cancers, but I don't agree with that for all cancers.

So, again, to talk about cancer as an entity is even more irrelevant than to talk about epithelial ovarian cancer as a -- as an entity. It's like talking about infectious disease.

Q. Okay. And in Table 2 of this article, the authors include a partial list of cancers that have been linked to reactive oxygen species. And ovarian cancer is listed, isn't it?

A. We can look at the reference. I have to see what the reference is.

Q. Well, I'm just asking you if it's listed in this table.

A. It's listed in the table.

Q. Okay. That was my question.

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In your report, you list the differences between a risk factor and a causal association, correct?

A. Yes.

Q. And what are those differences?

A. A causal association has some biological plausibility attached to it, a mechanistic plausibility.

Q. And turning to Page 16 of your report under plausibility.

MS. SHARKO: You can't write on the exhibits.

THE WITNESS: Oh, I can't draw? Sorry.

BY DR. THOMPSON:

Q. You state, "For an agent to be adjudged the cause of cancer, there must be a demonstration of a plausible biochemical mechanism."

What do you mean by demonstration?

A. What do I mean by demonstration?

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Q. Yes.
A. Experiment, scientific, you know, proof. Evidence.
Q. Doesn't that mean more than plausible?
A. No.
Q. Does plausible mean that there has to have been an experiment demonstrating the mechanism?
A. There has to be some evidence that the mechanism is true, yes. You know, just a hypothesis is not plausibility. Not biochemical plausibility.
Q. So in your opinion, the plausible mechanism has to be actually demonstrated by an experiment, correct?
A. Yes.
Q. Let's look at the Bradford Hill.
I believe you used this reference when you were doing the Bradford Hill evaluation in your report?
A. Which reference?

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Q. The Bradford Hill 1965. The original report.
A. Mm-hmm.
DR. THOMPSON: And I'll go ahead and mark this Exhibit 11.
(Document marked for identification as Exhibit Neel-11.)
BY DR. THOMPSON:
Q. Let's actually look at -- this will be Page 4, Page 298 of the original paper.
A. Page 2. Line what?
Q. 298, under plausibility.
A. Yep.
Q. And at least the Bradford Hill framework under plausibility states, "It will be helpful if the causation we suspect is biologically plausible. But this is a feature I am convinced we cannot demand. What is biologically plausible depends on the biological knowledge of the day."
Would you agree with me that

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Bradford Hill, when originally providing his guidelines, did not require that the mechanism be demonstrated by experimentation?
MS. SHARKO: Well, you didn't read that whole -- the whole section. Right?
DR. THOMPSON: I read what I read.
If Dr. Neel needs to read the whole section to answer my question, he can.
THE WITNESS: Yeah. This was in the context -- I read the whole paper. And this was in the context of when you have a hazard ratio of like, 240 to 1, like they did for chimney sweeps, then, you know, the requirement for experiment is less.
But for, you know, a series of epidemiological associations which are conflicting and weak, the biological plausibility

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becomes essential.
And then also this paper was written in 1965 when cancer biology was developed to a far lesser extent.
So I think that the general standard for a cancer biologist to accept causation would require experiments in 2019. And I state that as an editor -- a member of the editorial board of six journals, including the two most prominent cancer biology journals.
I can assure you that no one would accept a manuscript for publication in a high quality journal that did not have evidence of biological plausibility supported by experiments in 2019.
BY DR. THOMPSON:
Q. I'm just asking you Dr. Hill's statements regarding plausibility.
A. Well, I suspect Dr. Hill is

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no longer alive, but this is from 1965. And I don't think we should be applying 1965 standards to 2019 science.

Q. Isn't that what you applied in your report when you did the causation analysis?

A. I applied the general frame -- I applied the general framework. I didn't apply the -- every conclusion in Dr. Hill's paper.

Q. Okay.

A. Standards change over time.

Q. But looking at Bradford Hill, as published in 1965, and as you said, you applied in your report to some degree, you would agree that the mechanism does not have to be proven, correct?

A. The mechanism does not have to be proven to say what?

Q. To say that -- to be causative, the mechanism for how the agent is associated with an outcome, that causative, that it doesn't have to be

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proven?

A. There has to be some evidence for it. Some -- some credible scientific evidence for which there is none in the current case.

Q. Where could I find the -- the standard that you apply that it has to be demonstrated in an experiment for something to be causal?

A. Where could you find that standard?

Q. Where would I find an article that says that's the standard that should be used?

A. I'm telling you, I'm telling you as a scientist who is the editor of major scientific journals and a reviewer for every major scientific journal, that that is the accepted standard in science.

If you ask any major scientist in the United States what is the accepted standard for establishing causation, they will tell you a mechanism-based experiment. I don't

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think you can find a credible scientist in the world -- or in the United States or the world who would say otherwise. That is generally accepted scientific practice in 2019.

Q. And that's Dr. Neel's standard?

A. No. That is generally accepted scientific practice in 2019.

I'm sure that if -- you know, if you asked any other significant scientist in the United States, they would agree with that statement.

Q. But where can I find that published?

A. I don't -- I mean I don't know if it is published. But that is generally the -- that is definitely the standard.

Q. You would agree that plausible and demonstrable do not mean the same thing, right?

A. In the context of biological plausibility, yes, they do -- they do

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mean the same thing essentially.

They mean experimentally demonstrated or experimentally supported.

Q. Does the Bradford Hill analysis require the evidence to be compelling?

A. I don't know what -- what the Bradford Hill analysis means, whether Bradford Hill -- it doesn't mean -- I don't know if he uses the word compelling. We can read through the entire thing.

Again, I want to clarify, I used the Bradford Hill framework to reach my conclusions. I didn't necessarily use every single statement in Bradford Hill's paper.

Q. I agree. But I'm just talking about the Bradford Hill guidelines that you cited and applied in your report.

A. Framework.

Q. Do -- does the Bradford Hill framework require that the evidence be

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compelling?
A. We can read through the whole thing and see if he uses the word "compelling."
Q. Okay. Go ahead.
A. Okay.
Q. It would be under biological plausibility. That's what we're referring to.
A. Well, again, as I said before, the -- this is one of the criteria. If the other criteria are weak, this becomes extremely important. And there is no strong evidence of anything else.
So I don't really -- I don't know if he uses the word "compelling" in here. But in my opinion, in order to establish biological plausibility, there has to be compelling scientific evidence, yes.
Q. Okay. All right. In your opinion, does a Bradford Hill analysis require the evidence to be convincing?

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A. Yes. Not a Bradford Hill. My analysis. I can't really comment on what Bradford Hill would see as the standard.
As I said, I used the Bradford Hill framework to frame my report. I did not use Bradford Hill's personal opinion, obviously. I used my scientific opinion.
Q. Okay. But I'm -- but you had referred to the Bradford Hill analysis in your report, so I'm just trying to understand how you used that analysis in --
A. As a framework.
Q. -- as a framework.
Did the Bradford Hill analysis require that evidence be direct?
A. As I said, I used the Bradford Hill -- the Bradford Hill paper as a framework to discuss the issues regarding the pathogenesis of ovarian cancer and the relationship, if any, to talc. Okay. That is the only way that I

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used the Bradford Hill analysis, as a framework.
Q. And direct and plausible mean different things, right?
A. Direct and plausible mean different things? They clearly mean different things, but they don't mean different things in the context of convincing scientific evidence of biological plausibility.
Q. Okay. So in --
A. The common use --
Q. In the way that you have interpreted a causation analysis, a plausible mechanism would need to be direct evidence, correct?
MS. SHARKO: Were you done with your last answer?
THE WITNESS: I can answer it in the context of this question.
Can you repeat the question though?
BY DR. THOMPSON:

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Q. In the way that you have interpreted a causation analysis, a plausible mechanism would need to be direct evidence, correct?
A. It would need to be direct experimental evidence.
Q. Direct experimental evidence.
A. Yes, yes.
Q. And --
A. And can I finish? I actually wasn't finished.
Q. I'm sorry.
A. Direct experimental evidence that is scientifically credible that there is a causal relationship between the agent and the disorder under question, whether it's neoplastic or not.
Q. And same thing with definitive. Does the Bradford Hill framework work require that for evidence to be plausible, it should be definitive?
A. Again, I'm not using -- I'm using Bradford Hill criteria as a

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framework for addressing the issues of causation here in my report.
I don't know whether -- whether -- what was -- what was the word? Credible?
Q. We're on definitive.
A. Definitive. In my professional opinion, evidence has to be definitive to attribute causation. Yes.
And by definitive, I mean credible scientific data to support the plausibility claim. And there is none in this case.
Q. Does the evidence under a Bradford Hill framework for the mechanism to be plausible need to be conclusive?
A. Again, I'm going to say the same thing that I said before.
In order to have an argument in favor of biological plausibility, the data has to be conclusive and convincing.
Bad data are of no use. Bad experiments are of no use. Sometimes they are of less than no use, because

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they are misleading.
Q. And this is the last one.
A. Sure.
Q. And I just want to understand words that you have used in your report.
A. Mm-hmm.
Q. Using a Bradford Hill framework, does evidence for plausibility need to be strong?
A. In my opinion, to attribute causation of any agent to the initiation of any malignancy, the evidence has to be strong, convincing, and definitive, yes.
Q. Okay. Let's move on to another topic.
Is it your opinion that the genital use of talcum powder is not a risk factor for epithelial ovarian cancer?
A. Yes. That's my opinion.
Q. And can you cite any literature that explicitly states that talcum powder use in the perineal area is

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not a risk factor for epithelial ovarian cancer?
A. That states it's not?
Q. Yes. An article that says we have reviewed the evidence and talcum powder is not a risk factor for epithelial --
A. I think that it's not an established risk factor. There is no -- there is no agreement on talc being a risk factor for ovarian cancer. So it's not an established risk factor.
I think, you know, we can go to my report, but I'm pretty sure statements were made to that effect by IARC, possible. They said the data aren't compelling. So yes.
Q. Is it not what -- is it that it's not well established, or is it not a risk factor?
A. There is no compelling evidence. There is no credible scientific evidence that it's a risk factor. There is no consistent evidence

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that it's a risk factor. There is no agreed-upon definition that it's a risk factor.
Q. Is it a possible risk factor?
A. I think that, you know, IARC considers it a possible carcinogen as of 2010.
I think the evidence that's developed 2010 makes it less likely that it's even possible.
Q. Could credible scientists look at the evidence and determine that the genital use of talcum powder is a risk factor for ovarian cancer?
A. No, not in my opinion. I don't think so.
Q. So would those doctors or scientists, looking at the evidence and reaching those opinions be uninformed?
A. I can't comment on the basis of their opinions without seeing their opinions.
Q. But at least in your

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opinion, they could not credibly come to that conclusion?
A. Not based on the evidence that I reviewed and considered in my report, no.
Q. Okay. And you have a section in your report on risk factors for ovarian cancer in which you discuss some of them, beginning on Page 12.
You only cite one article, and that is the Reid paper. And we'll mark that as 12.
(Document marked for identification as Exhibit Neel-12.)
MS. SHARKO: Where -- where are you talking about?
THE WITNESS: It's on the next page.
MS. SHARKO: So we're not on Page 12.
DR. THOMPSON: Well, it begins multiple factors likely contribute to ovarian cancer, on

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Page 12.
THE WITNESS: I got it.
BY DR. THOMPSON:
Q. This is the paper that you refer to in your report as really the only paper that you -- that you cite on risk factors for ovarian cancer, correct?
A. Yes, because it's the most recent comprehensive review on the subject.
Q. And the authors are epidemiologists, correct?
A. Yes.
Q. They are not physicians, correct?
A. No, but Tom Sellers is an expert in ovarian cancer epidemiology. I know him personally. He is the director of Moffitt Cancer Center in Tampa.
Q. And the authors actually state that "other possible risk factors include environmental and lifestyle factors such as asbestos and talc powder exposures."

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Do they state that?
A. Actually I think you're misstating their conclusions. I'll read their conclusions.
Q. Well, I -- only --
A. "However a" --
Q. I --
A. You asked me a question. Can I answer it?
Q. I -- I am reading, did I read this correctly: "Other possible risk factors include environmental and lifestyle factors such as asbestos and talc powder exposures and cigarette smoking."
Did I read that correctly?
A. Where are you reading at?
Q. In the abstract?
MS. SHARKO: So wait a minute. You asked him a question. He tried to answer it. You interrupted him.
DR. THOMPSON: Well, I asked him --

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MS. SHARKO: He gets to answer the question or you withdraw it.
DR. THOMPSON: I asked him if they stated that. He did not need to tell me about something else when I was asking the question, was that stated by the authors.
MS. SHARKO: You don't need to raise your voice. He's trying to answer your question.
DR. THOMPSON: Okay. All right.
Let's just start all over. I think the record will speak for itself.
BY DR. THOMPSON:
Q. Dr. Neel, do the authors state --
A. Where are you quoting from first?
Q. In the abstract, the next to the last sentence.

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Do the authors state:
"Other possible risk factors include environmental and lifestyle factors such as asbestos and talc powder exposures and cigarette smoking"?
A. Yes, that's what it says there. But it's out -- you are reading it out of context.
Q. I just ask if they say that.
But you didn't include in your report where you use this article, that the authors stated that possible risk factors include environmental and lifestyle factors such as asbestos and talc exposure, did you?
A. The entire -- my entire report was focused around talc. The other -- what I cited in this context, in my report, were the other claimed risk factors in ovarian cancer. I was discussing the other risk factors. The rest of the report concerns my views on talc as a risk factor. So there was no reason to cite it here. The entire

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report concerns that.
But again, I must insist that you are taking out of context Dr. Reid -- Dr. Sellers' conclusions. I found Dr. Sellers' conclusions to be quite continent with my own based on the actual section --
Q. And you'll have another opportunity if Ms. Sharko wants to come back.
MS. SHARKO: Wait.
Were you done with your answer?
THE WITNESS: I was almost done. Okay.
MS. SHARKO: Finish your answer.
THE WITNESS: If one goes to Page 18 of the same paper that you're citing, and actually reads the section on asbestos and talcum powder, you will see that his opinions and mine are almost identical.

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So I -- I don't really think there's any conflict here.
And you stated out of context what's in the abstract.
And -- and again, a lot of times when authors are setting up a paper, they will post, you know, all possibilities that are in the literature and then they will reach their own conclusions.
So for you to lift that out of context is really not accurate in my opinion.
BY DR. THOMPSON:
Q. And did you review any other articles that discussed risk factors for ovarian cancer other than the Reid paper?
A. Yes, I -- I read multiple papers on ovarian cancer pathogenesis, but I can't tell you right now.
I cited this one, because this is the most up-to-date comprehensive view of ovarian cancer risk factors.
And my goal in my report was

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not to write a review of all the risk factors for ovarian cancer. The goal of my report and the topic which I'm here to testify here today on, is the role of talc and Johnson & Johnson products in -- and the possible role of talc and Johnson & Johnson products in ovarian cancer pathogenesis.
The entirety of my report focuses primarily on that issue. This section on other risk factors was in the context of background of other issues concerning ovarian cancer. Not whether or not talc was involved.
Q. Okay. Let's just look at some other articles relating to risk factors --
A. Sure.
Q. -- and see if there are scientists that disagree with that opinion.
A. Well, I just want to clarify again. Dr. Sellers does not --
MS. SHARKO: Wait, wait,

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wait.
THE WITNESS: -- disagree with my opinion.
BY DR. THOMPSON:
Q. I -- we have moved on from Dr. Sellers.
A. Okay. Well, you said other scientists so I just want to get --
Q. Well, I'm about to show you --
A. Okay.
MS. SHARKO: She's going to ask you a new question.
BY DR. THOMPSON:
Q. I'm going to ask you a new question.
MS. SHARKO: That was just a speech.
THE WITNESS: Okay.
MS. SHARKO: Wait for a question.
THE WITNESS: I thought that was -- okay.
MS. SHARKO: Okay.

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There is exhibit -- what is that, 13?
(Document marked for identification as Exhibit Neel-13.)
BY DR. THOMPSON:
Q. And I'm handing you Exhibit 13, which comes from a textbook titled "Cancer Prevention and Screening."
And if you will turn to Page 337.
MS. SHARKO: Do you have the year on this?
THE WITNESS: 2019. It's on the bottom of the first page.
BY DR. THOMPSON:
Q. So you would agree that --
A. What page please?
Q. 337.
A. Okay.
Q. So you'll agree that this is an up-to-date chapter in a textbook as well?
A. Yes, but I've never heard of

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these authors.
Q. Okay. That wasn't the question.
Under lifestyle factors, these authors state, "A lot of work has been done to clarify the risk reduction of various lifestyle approaches, such as alcohol, obesity, cigarette smoking and talc use. Some of these are subtype specific, such as endometriosis, cigarette smoking and obesity, while others are general risk factors.
"Use of talc in the genital area has consistently been shown to increase the risk of ovarian cancer and, therefore, is not recommended."
Did I read that correctly?
A. Yes, you did.
Q. So these authors at least do consider talc use a risk factor, correct?
A. Apparently.
Q. And -- and consider it a general risk factor, even understanding that there are some risk factors that are

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subtype specific, correct?
A. Well, I think these authors have no knowledge of modern cancer biology, because it's not possible to cause the same genetic defects with a different agent that works by different mechanisms.
Q. So the authors of this paper in your opinion are wrong?
A. Yes, in my opinion.
I should also -- can I just say one other thing about this?
Q. Yes.
A. It's notable that they cite references for alcohol, obesity and cigarette smoking, but they don't cite any references for talc use. So I can't respond to --
Q. And there's no -- there's no question pending on the table.
MS. SHARKO: Let him finish. Let him finish.
MS. O'DELL: There's no question --

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DR. THOMPSON: There's no question.
THE WITNESS: I didn't finish my answer.
MS. O'DELL: This is not his opportunity just to speak without a question. There is no question.
MS. SHARKO: He was answering the question.
DR. THOMPSON: He was not answering my question.
MS. SHARKO: That's your opinion, because you don't like it. Dr. Neel, finish your answer.
BY DR. THOMPSON:
Q. Exhibit -- Exhibit 14 --
MS. SHARKO: Stop. Dr. Neel, finish your answer.
BY DR. THOMPSON:
Q. Are you finished with your question, Dr. Neel?
A. No, I was saying --
Q. I mean your answer.
A. -- in reading the piece --

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the part that you mentioned, it's notable that they don't reference anything for their statement on talc use. It would be much more helpful if we could see what evidence they want to adduce to make their claim.
I provided very substantial evidence in support of my opinions. And I've also been able to discuss them.
This is, you know, an isolated statement if a textbook that, you know, probably hasn't undergone scientific review.
Q. Well, risk factors, you cited one article. We'll make that clear.
MS. SHARKO: Well, wait. No, wait a minute. You don't just get to lob out comments.
BY DR. THOMPSON:
Q. Did you cite one article in your risk factor discussion in your paper?
A. I cited one article about

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risk factors, but I didn't cite one article about talc, which is the issue.
Q. Dr. Neel, if you would try as best you can to answer my question.
A. I am answering your question.
Q. And my question was just did you cite one article. And the answer would be yes.
I just handed you a paper --
MR. LOCKE: Objection.
MS. SHARKO: You don't -- you don't need to respond to that speech. Let's move on to the next exhibit.
DR. THOMPSON: I don't think I had a question.
(Document marked for identification as Exhibit Neel-14.)
BY DR. THOMPSON:
Q. The next article is from 2012, "Ovarian Cancer Etiology, Risk Factors, and Epidemiology."

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And these authors, turning to Page 6, have a chart listing risk factors for epithelial ovarian cancer.
If you'll turn to that, it's on Page 6.
A. Yeah I have it.
MS. SHARKO: And this is Exhibit 14 for the record.
DR. THOMPSON: Exhibit 14.
MS. SHARKO: Thank you.
BY DR. THOMPSON:
Q. And at least these authors, list under inflammatory risk factors that increase the risk for ovarian cancer, perineal talc use, endometriosis, and pelvic inflammatory disease.
Would you agree that these authors list talc -- perineal talc exposure as a risk factor?
A. They do. But this is completely non-consummate with modern research.
Q. I'm just asking you if the authors list it.

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A. Yes, they --
Q. Okay. And so these scientists who do feel -- are of the opinion that it's a risk factor are wrong?
A. I don't know that they're scientists. I mean, they --
Q. They're doctors. These doctors --
A. There's a big difference between a doctor and a scientist. Since I have both degrees, I can state that to a very strong degree of confidence.
Q. Are you saying that someone has to have two degrees to --
A. No, but I'm saying that I'm very familiar with the difference in the training of the average physician and the average scientist and their ability to evaluate scientific data, and they're not the same.
Q. The next one --
A. There are definitely -- Can I finish? There are

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definitely physicians who are eminently qualified to evaluate scientific data. But the average practicing physician is not able to evaluate modern molecular data like the molecular biologist or cancer biologist. They're different disciplines.
Q. If an M.D., gynecologic oncologist, who is familiar with the literature in the field gives an opinion that talcum powder use in the genital area can cause or contribute to ovarian cancer, are they wrong?
A. Possibly. In my opinion they're wrong, because I've reviewed the literature comprehensively including the molecular literature, which they are probably not capable of evaluating, and they're not capable -- the average gynecologist oncologist is definitely not capable of evaluating the modern molecular data, such as mutational signatures and other more modern and comprehensive analyses that would speak

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to any particular agent's ability to cause any kind of cancer.
We know a lot -- and by the way, again, you're citing papers from 2012. That's a lifetime ago in cancer biology, and specifically in ovarian cancer pathogenesis. We know much more about the cell and molecular biology of ovarian cancer today than we did then.
And the fact that they put endometriosis in here is exemplary of that, because we know that endometriosis is a risk factor only insofar as the cancer is probably coming from the endometrial cells.
Q. And let's turn --
A. It's a cell of origin issue. It's not a carcinogenesis issue.
Q. The next -- the next paper that I'm going to give you is titled "Risk Factors For Ovarian Carcinoma."
(Document marked for identification as Exhibit Neel-15.)

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BY DR. THOMPSON:
Q. And this was published in 2018, correct?
A. Mm-hmm.
Q. If you'll turn to Page 4.
MS. SHARKO: So for the record, this is Exhibit 15.
DR. THOMPSON: I'm sorry. Exhibit 15.
MS. SHARKO: Okay. Thank you.
DR. THOMPSON: I'll try to be better about that.
BY DR. THOMPSON:
Q. This article titled "Risk Factors For Ovarian Cancer," if you'll turn to Page 4. There's a chart with risk factors.
And this particular paper does divide the risk factors up by subtype, correct?
A. Yes.
MS. SHARKO: You are allowed to read the paper.

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THE WITNESS: I'm looking at it, yeah.
MS. SHARKO: Okay.
THE WITNESS: Mm-hmm.
BY DR. THOMPSON:
Q. And the heading for Table 1 is "Summary of Putative Cells of Origin and Identified Risk Factors For Specific Ovarian Cancer Histologic Subtypes," correct?
A. Yes.
Q. And so these authors at least considered the different subtypes when they were trying to classify the risk factors, correct?
A. Yes.
Q. And if you'll look in this chart under the heading Lifestyle Risk Factors, "Genital powder use is included under subtype all serous and subtype endometrioid and subtype clear cell."
A. Mm-hmm.
Q. Do you agree that authors considered that a risk factor for those

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three subtypes?
A. Yes.
Q. Are these authors wrong?
A. Yes. And the reason they are wrong is because, if you look at the mutational signature, the type of molecular causation of clear cell and endometrioid cancer, it's completely different than the molecular basis for serous ovarian cancer.
One of them is caused by chromosome abnormalities in copy number variations, and the other is caused by point mutations in pathways that I've spent my entire career studying.
(Document marked for identification as Exhibit Neel-16.)
BY DR. THOMPSON:
Q. Next, Exhibit 16.
This is another paper that discusses risk factors. It's part of the African American cancer epidemiology study that's published numerous articles.

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Looking at the -- and it was published in 2018?
A. Mm-hmm.
Q. Looking at the end of the paper, page -- I don't see the page. But at the very end before, in -- in summary --
A. In the discussion?
Q. In -- in discussion, conclusions. It states, "In particular, talc powder use" --
A. I'm sorry, I can't see where we are.
Q. They --
A. Oh, I see. Okay. I got it.
Q. In the last -- next to the last paragraph.
"In particular, talc powder use is highly prevalent in the African American community and has been found to be associated with increased risk of ovarian cancer in this and other studies. Indeed, regression models excluding talc use overestimated the associations in our

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analysis."
Do you agree that these authors consider talc use to result in increased risk of ovarian cancer in African American population?
A. This is yet another of many case-control studies which, you know, claim to see an association. But they are subject to the same type of recall bias and other classification bias that is prone to be found in case-control studies.
The cohort studies don't show this. And they are much more reliable in my opinion.
That -- you know, so yes, they say it, but that doesn't make it true.
Q. So these authors are wrong to consider talc use a risk factor for ovarian cancer?
A. I don't think they've done a complete analysis of the literature and they are probably not capable of

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evaluating the molecular issues.
(Document marked for identification as Exhibit Neel-17.)
BY DR. THOMPSON:
Q. The next article is marked Exhibit 17. It's a patient by Wu and her colleagues.
MS. SHARKO: It's a paper.
DR. THOMPSON: What did I say?
MS. SHARKO: Patient.
DR. THOMPSON: Sorry. Oh boy.
BY DR. THOMPSON:
Q. It's a paper.
MS. SHARKO: It's almost like a patient.
BY DR. THOMPSON:
Q. Let's -- let's ask that question over again.
Exhibit 17 is a paper by Dr. Wu that discusses the nongenetic risk factors for ovarian cancer, correct?

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A. Mm-hmm.
Q. And under the discussion section of this paper, the authors state that, first paragraph, "With the high mortality" --
A. Where -- I'm sorry, I have to find it.
Q. Under discussion, first paragraph. Page 1098.
"With the high mortality and the lack of effective early screening for ovarian cancer, better understanding of preventive risk factors is a priority. The primary motivation for this analysis was to determine whether the six confirmed nongenetic risk factors for IEOC (parity, use of oral contraceptives, tubal ligation, endometriosis, first degree family history of ovarian cancer, and use of genital talc in non-Hispanic whites are also risk factors in Hispanics and African Americans)."
Do you agree that these authors believe the use of genital talc

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to be a confirmed nongenetic risk factor for ovarian cancer?
A. They apparently do.
Q. And are these authors wrong as well?
A. Yes. And I -- I --
Q. You didn't hesitate with that opinion, did you?
A. No. Because again, if you -- if you -- you're pulling out individual case-control studies. And we already know that 60 percent of the case-control -- 67 percent of the case-control studies reach one conclusion, 33 percent reach the other conclusion, and all the cohort studies are negative.
That is why if you read a review like Dr. Sellers' review, which is a comprehensive review of the recent literature concerning risk factors, you will find an opinion very similar to mine, which is that there is no compelling evidence that talc was a

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causal -- is a cause of ovarian cancer. And that's the basis of my opinion.
This is an -- this is a single paper of a case-control study and, you know, that's not as strong as considering the entire body of the evidence as I've done in my report.
Q. But doctors and scientists that have a different opinion as you've stated are wrong, correct?
MS. SHARKO: Object to the form of the question.
THE WITNESS: In -- in each individual case, I'm happy to tell you whether I think they are wrong or not. Okay.
Since I haven't met every doctor and scientist who may have a particular opinion, it would be inappropriate for me to say that all doctors and scientists who have a different opinion are wrong.
If someone comes up with

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some evidence that is convincing, I will change my opinion. Right now, all of the available evidence suggests that there is no association between genital talc and ovarian cancer. And some of their evidence says that there isn't.

So there is no evidence to support the case that genital talc application causes ovarian cancer in my scientific opinion.

BY DR. THOMPSON:

Q. Where is the evidence that there isn't?

A. Where is the evidence that there isn't?

Q. I think I asked you that before and you could not cite to an article that said it is not a risk factor.

A. I --

Q. So I would like for you to, if you do have one, I would like to know

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what --

A. Oh. So --

MS. SHARKO: Object. Object to the form of the question. Lacks foundation. Misstates his testimony and apparently asked and answered since you said you asked it before.

DR. THOMPSON: Well, he had a different answer. I wanted to clarify it.

MS. SHARKO: I don't think so.

BY DR. THOMPSON:

Q. Dr. -- Dr. Neel, do you have -- just so I am clear.

Do you have an article that you can point to that explicitly states that talcum powder is not a risk factor for ovarian cancer?

A. So that was a different question than you just asked before. The -- the question you asked before is do I have a paper that says that genital

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talc is not a risk factor for ovarian cancer. And I said that was a risk factor question.

If you ask me is there any evidence that genital talc causes ovarian cancer, there are several papers which argue against that and I'm happy to cite those.

Q. My question was risk factors, so...

A. Okay. But you didn't ask that question right before. So I was answering it -- you know, you changed your question, which is why it's a different answer.

If you ask me the second question I'd be happy to tell you.

Q. Okay. So just to be clear, the answer to the question is, is there a paper that explicitly states that talcum powder is not a risk factor of ovarian cancer, you don't have one to point to?

A. There are -- there are many papers that review the literature --

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Q. I need a yes or no --

A. You misstate --

Q. -- question.

MS. SHARKO: No, no, no. Wait. Timeout.

THE WITNESS: You asked --

DR. THOMPSON: Well, he is answering all kinds of questions that are not what I'm asking.

MS. SHARKO: Well, I disagree. But you've asked your question. He's entitled to answer it. If you want to withdraw your question so be it.

But you can't interrupt him because you don't --

DR. THOMPSON: No, I want an answer to my question.

MS. SHARKO: -- you don't like his answer.

DR. THOMPSON: Okay. Let's go back and see what the question and answer were.

BY DR. THOMPSON:

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Q. Just to be clear, is there a paper that explicitly states that talcum powder is not a risk factor of ovarian cancer? You don't have one to point to.
And his answer, is there are many papers --
A. You didn't let me finish. Would you like me to finish?
Q. Okay. Well, the question though was point me to a paper that explicitly states that talcum powder is not a risk factor for ovarian cancer.
A. Scientists don't generally speak in that language. What they would say is very similar to what Dr. Sellers said, and which most of the review articles about this topic say and what I say. Which is there is no credible scientific evidence that.
That is how scientists speak. We have a language that we use, just like lawyers have a language that lawyers use.
And in scientific credence

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saying that -- in scientific language, saying that there's no credible scientific evidence is the way we would state the -- the conclusion. And that's how I'm stating it. That's very similar to how Dr. Sellers concluded it. And I -- I think that's the essence of my statement.
Q. So your answer would be you're not able to answer that question?
MR. LOCKE: Objection.
THE WITNESS: No, my answer is exactly what I said.
BY DR. THOMPSON:
Q. Okay. We'll -- we'll move on.
But I don't believe I got the answer to the question: Can you point me to an article that states that talcum powder is not a risk factor for ovarian cancer?
MS. SHARKO: All right. That's not a question. That's an editorial comment.

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BY DR. THOMPSON:
Q. Can you point me --
MS. SHARKO: No. You asked him that question already.
DR. THOMPSON: But I still haven't got an answer. I'm going to try one more time.
BY DR. THOMPSON:
Q. Can you point me to an article that explicitly states that talcum powder is not a risk factor for ovarian cancer?
MS. SHARKO: Objection. Asked and answered.
You may not like the answer, but you got an answer.
DR. THOMPSON: Okay. The record will speak for itself that there is not an answer.
MS. O'DELL: It was asked but never answered. He didn't answer the question.
MS. SHARKO: Okay. I thought -- I thought your side

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said the rule was that only one lawyer can talk.
MS. O'DELL: I think the evidence will show, the record will show over depositions that you weren't defending, Susan, you had plenty to say, so I don't know that I would raise that.
DR. THOMPSON: Including last week.
MS. SHARKO: So the rules are that one lawyer gets to question the witness. So let's --
MS. O'DELL: I'm not questioning the witness. But I'm free to speak and I will speak.
MS. SHARKO: You know what? It seems like maybe we should just take a lunch break and let everybody simmer down.
DR. THOMPSON: I only have -- I don't need a lunch break.
MR. TISI: I'm going to tell

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you, can I have that section?
MS. SHARKO: So now we have a third plaintiff's lawyer talking?
MR. TISI: No, no, no. We're off -- we're not talking about this.
Can I have that clipped, Ms. Sharko's comment so I can use it in other depositions going forward? Please, thank you. You can send me that.
Because I expect we're going to need it going forward, given her behavior in the past.
Thank you.
DR. THOMPSON: Okay.
MS. SHARKO: You know, Mr. Tisi, behave yourself.
DR. THOMPSON: I want -- I want to move on.
MR. TISI: I -- I don't need to be schooled by you.
BY DR. THOMPSON:

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Q. Is it -- is it your opinion --
MS. SHARKO: Yeah, because you don't listen.
MR. TISI: That's because -- that's because I wouldn't listen to somebody who tries to school me.
DR. THOMPSON: I really don't want to waste my time, so...
BY DR. THOMPSON:
Q. Is it your -- Dr. Neel, is it your opinion that asbestos is not a risk factor for ovarian cancer?
A. I don't have an opinion on asbestos in ovarian cancer. I haven't really given enough study to --
Q. Okay. So you don't have an opinion one way or the other as to whether asbestos --
A. Not -- not a strong opinion, no.
Q. Okay. Any opinion?
A. I think the evidence is

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unclear.
Q. What -- how do you define a carcinogen?
A. A carcinogen? A carcinogen is an agent that causes cancer.
Q. And that would include initiation?
A. Mm-hmm.
Q. And promotion?
A. Probably -- so there's a difference between health scientists and experimental carcinogenecist would define a carcinogen and how the public would use the word carcinogen.
In the common parlance, a promotor, a tumor promoter would probably be considered a carcinogen. But in scientific language a carcinogen is just the initiating event.
Q. But you'll agree that in some context at least, scientists refer to a carcinogen in each of those phases?
A. Yes. Mm-hmm, yes.
Q. And is it -- is that

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sometimes referred to as a complete carcinogen?
A. That's a kind of old term, but yes.
Q. I'm old.
MS. SHARKO: Do you want that on the record?
DR. THOMPSON: What the hey.
MS. SHARKO: You are not old, Margaret.
DR. THOMPSON: Thank you, Susan. That's the nicest thing you've said today.
MS. SHARKO: Chris will order that page too.
MR. TISI: I was -- I was going to say. I was going to -- I wouldn't qualify it by today. I'd make it a year, but go ahead.
BY DR. THOMPSON:
Q. So let's go to Page 14 of your report --
A. Do you have a long question? Because if not, I'm going to have to take

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a break. That coffee is having its effect.
Q. I'm fine breaking for lunch or --
A. If it's a short question I can answer it.
MS. SHARKO: No, we don't want --
THE WITNESS: Okay.
DR. THOMPSON: Yeah, let's -- let's go -- this is actually a natural break so...
THE WITNESS: Okay.
MS. SHARKO: Okay.
THE VIDEOGRAPHER: Stand by, please. The time is 11:54 a.m. Off the record.
- - -
(Lunch break.)
- - -
THE VIDEOGRAPHER: We are back on the record. The time is 1:02 p.m.
BY DR. THOMPSON:

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Q. Dr. Neel, this morning you testified that you are not an epidemiologist.
Is it fair to say that your opinions in this case are focused on whether or not there's credible evidence that talcum powder can cause ovarian cancer from a molecular standpoint?
A. I would say from a molecular and -- and cellular standpoint.
Q. From a molecular and cellular standpoint?
A. Yes.
Q. And it's your opinion that there's no cause and effect. But is it also your opinion that there's no plausible biological mechanism for any association between talcum powder use and ovarian cancer?
A. I don't think there's any evidence one way or the -- any credible evidence one way or the other.
So there's no -- there's no credible evidence that talc causes

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transformation of ovarian cancer cells or that talc causes inflammation that's relevant to ovarian cancer pathogenesis.
Q. So just to shorten that a little bit, there's no credible evidence that there's a plausible biological mechanism for any association between --
A. Yes.
Q. Let me finish, sir.
A. Sorry.
Q. -- between -- just so the record is clear --
A. Sorry.
Q. -- between talcum powder use and ovarian cancer?
A. Yes. That's my testimony.
Q. So this morning we discussed risk factors, cause, association. This afternoon I'd like to delve into that molecular cellular mechanism a little bit more if that's okay.
On Page 12 of your report, next to the last paragraph, you state, "Taken together these findings clearly

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show that different types of ovarian cancer originate in different cell types that suffer different types of mutations which are unlikely to be caused by the same environmental agent."
Explain that sentence to me.
A. Okay. So there is Type 1 tumors and there's Type 2 tumors, and the Type 1 tumors are caused largely by point mutations, and the Type 2 tumors are caused largely by copy number abnormalities or copy number variation and rearrangements. And the underlying mutagenic mechanisms that cause point mutations and the repair defects that cause point mutations are distinct from the types of mutations -- mutational processes that cause copy number variation and translocations.
So an agent that does one kind of genetic event is not likely to cause the other.
Q. Do you have -- what is the basis for that opinion? In other words,

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what article could you direct me to that would make that same claim?
A. I can't cite an article off -- that's general scientific knowledge in my field. I can't cite a specific article.
Q. So it's not possible in your opinion that the same environmental agent could cause the molecular changes in both types of cancers or more than one type of cancer?
A. It's -- I think I said it's unlikely.
Q. Oh, unlikely. So --
A. That's the word I'd like to stick with, unlikely.
Q. -- stick with unlikely. Okay.
A. I didn't say possible. I said unlikely.
Q. Okay. And I wasn't trying, in that case, to -- to trick you. I was -- I was just trying to understand --
A. Did you want to just tell me

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when you're trying to trick me?
Q. Do you want me to give you a warning before it's a trick question?
A. Yeah. Maybe.
Q. So how would you answer the question does smoking cause lung cancer?
A. Yes.
Q. Even though there's some types of lung cancer that it may cause and there's others that it might, and it might cause more than one?
A. There's --
Q. Is that an analogy?
A. No, it's not an analogy. Actually it makes my point quite well. Because smoking causes specific types of DNA changes. So the carcinogenic agent in cigarette smoke that causes lung cancer are benzopyrenes. And there's actually a specific molecular signature -- this is one of the major advances that has happened in the last three years primarily -- large scale sequencing studies of exome sequencing,

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and in some cases whole genome sequencing, has so many different types of mutations that you can actually categorize the mutations according to their carcinogenic agent.
So benzopyrenes have a particular mutational signature. And so you can actually see which forms of lung cancer are caused by that signature and which forms aren't.
So for example, nonsmokers can get lung cancer, but smokers are about 20 to 25 times more likely to get cancer, and the cancers that come from smoking have a characteristic molecular signature, whereas the cancers that come from -- that come in nonsmokers do not have the character -- do not have the same signature. So you can tell them apart easily.
Q. And even different types of cancer that are caused by smoking have the -- that same molecular signature?
A. No, not all signature -- not

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all smoking-associated cancers have the mutational signature of smoking. Only the aerodigestive malignancies.
Q. So there are some type of lung cancer that may be caused by smoking that don't -- aren't caused by that same mutation?
A. No, no, I didn't say that. All --
Q. Okay. I'm just trying to understand.
A. All smoking-associated lung cancers have the benzopyrene signature. I don't remember the number. They have different -- different -- there is several major groups that have been doing this work, and they have different numbers of the signatures.
So actually one of the references that I cite has one of the numbering systems. So I can't tell you the number.
But there's -- if you looked at -- actually if you go to Cosmic, which

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is the website in my report, it has a whole section on mutational signatures and it tells you which ones are smoking associated.

Q. And --

A. And -- and the -- so the small cell lung cancer, squamous cell lung cancer and many but not all adenocarcinomas of the lung are caused by smoking largely.

There are some lung cancers that are probably caused by radon and others that are -- we don't know the pathogenesis yet.

Q. What about when smoking is a cocarcinogen?

A. Yeah, so it's less -- less -- what do you mean by cocarcinogen?

Q. For example, you agree that smoking and asbestos together cause -- are more likely to cause cancer than either by themselves?

A. So smoking plus asbestos are dramatically cocarcinogenic for lung

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cancer. And I don't know if there's been a detailed study of smoking plus asbestos lung cancer that's been sequenced.

But I would strongly suspect that mutational signature of benzopyrenes is there. But I don't know that. I don't know if it's been done.

Q. So do we need to discount any literature in which sequencing has not been done yet for any type of cancer?

A. Discount it from the standpoint of what?

Q. Is it not reliable?

A. It depends what the question is. I mean, what aspect of the cancer are you asking about?

Q. I'm just asking that, if literature, epidemiological literature particularly, doesn't include the molecular knowledge gained by sequencing and other methods, should it be discounted?

A. Discounted in terms of what?

Q. Should it not be considered

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reliable?

A. No. It's reliable insofar as it's epidemiological evidence one way or another for a particular disease.

But I should add there's been extensive sequencing of ovarian cancers over -- I don't remember if it was 400 -- I'm blocking on whether it's 450 or 600 cases are in the literature. It's easy to find. So it's not like ovarian cancer has been sequenced. That's how we know that the Type 1 tumors and Type 2 tumors have completely different mutational profiles.

Q. Okay. Well, the second sentence in that paragraph is, "Studies including epidemiological reports that treat ovarian cancer as a single entity should, in my opinion, be viewed with skepticism."

And I guess my question would -- because we have the sequencing that -- sequencing that you're referring to, should epidemiological studies that

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are treating ovarian cancer as a single entity be discounted?

A. I didn't say that.

I said they should --

Q. Well, I'm kind of -- I'm sorry. I'm trying to --

A. I stand by the wording in my report.

Q. Well --

A. They should be viewed with skepticism --

Q. Well, I'm trying to --

A. -- because they're not the same disease.

Q. I'm trying to determine what you mean by "viewed as skepticism." Are they less reliable --

A. They are less scientifically plausible.

Q. They're less scientifically plausible?

A. It is less plausible. It is implausible that a single agent acting via a single carcinogenic mechanism would

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cause dramatically different mutational processes leading to dramatically distinct mutational signatures.

Type 1 tumors and Type 2 tumors originate in different cell types. That's pretty clear. And they have dramatically different mutational signatures.

The fact that they have different mutational signatures means that they're caused by different molecular processes.

Therefore, it is highly unlikely that a single agent acting via a single pathogenic mechanism would lead to distinct molecular signatures acting in different cells of origin.

Q. Are there risk factors and protective risk factors for epithelial ovarian cancer that cross all types in your opinion?

A. I don't really -- I can't -- you know, not coming to mind right away, not that I know of, no.

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Q. So --

A. Well, so -- for example, let me just -- what do you mean by all types? So for example, the -- you know, obesity is associated with, you know, endometrioid and clear cell. But those are the same type of pathogenic mechanisms.

Q. How about the reproductive risk for protective factors, for example, parity, oral contraceptive use, that appear to apply to all subtypes, histologic subtypes, as well as Type 1 and Type 2. Would you agree?

A. Yeah, I think parity probably does. But I -- that's not clear that could be a single entity either. That could be more than one entity. In one case, it could be incessant ovulation. In the other case, it could be the weak -- it could be that both mechanisms have been purported to explain the parity effect could operate differently in different Type 1 and Type 2 tumors.

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Q. What about age?

A. Well, age is -- age is just due to the accumulation of mutations. All mutations are more common with age. So age is -- age is a contributor to all forms of cancer, but that's because the chances of accumulating the necessary mutations by any mutational process increase with age.

Q. What about BRCA1 and 2?

A. BRCA1 and 2 are primarily Type -- Type 2 tumors.

Q. And only serous?

A. Well, some people would call, you know, the peritoneal carcinomas and the carcinosarcomas separate. But I think molecularly they -- most people would view them as Type 2 tumors, effectively the same as serous cancer, yes.

Q. And you're including --

A. High grade serous, not the low grades.

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Q. And you're including endometrioid and clear cell with the Type 1 tumors?

A. No. Oh, with the Type 1, yeah. Sorry. Yeah, I'm a little -- it's a little -- it's the postprandial thing. I shouldn't have eaten anything.

Q. Let's go to your report on Page 14. And you begin Section 3, talc and ovarian cancer. And it looks like to me this is where you put your major opinions in bold. And it says "Opinion."

In the paragraph that states, "Talc is chemically inert and nongenotoxic," you have three references there.

This morning you testified that you only saw the Health Canada risk assessment yesterday and that you had not read it, correct?

A. I think that I -- I didn't see the Health Canada actual text. I must have seen something that said it was possibly carcinogenic, but I don't know

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where I saw that. It might be -- I'm citing the paper. I think it's the Taher, et al., paper. That's what I assume it is.

Q. Well, that's what I'm trying to establish. So that when you said Health Canada reviewed the literature, you haven't actually read the Health Canada assessment, right?

A. I read the -- was it Taher? What are you calling it?

Q. Taher.

A. Taher. I read the Taher, et al., paper --

Q. Okay.

A. -- that said that it was funded by Health Canada.

Q. So that's -- that's wrong that Health Canada reviewed the literature, correct?

A. It says, "The Taher, et al., manuscript that was funded by Health Canada."

So that's what I'm referring

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to.

Q. Okay. So is it your understanding that Health Canada commissioned Taher and his group to do a meta-analysis, and that's what Health Canada relied on in part on their risk assessment, correct?

A. That's my understanding, yes.

Q. But each time that you're referring to Health Canada in your report, you're actually referring to the Taher paper?

A. That's correct.

Q. Because you have not read -- actually read the Health Canada risk assessment?

A. That's correct. I read the Taher, et al., manuscript, funded by Health Canada, as it says in my report.

Q. Okay. Well, your report actually says Health Canada had reviewed the literature.

A. So I -- maybe it was --

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could have been a little bit --

Q. Yeah.

A. -- sloppy writing.

Q. And it says, "It focuses primarily on a meta-analysis by Taher." So it -- but you're saying that you meant Taher reviewed the literature, not Health Canada?

A. Yes.

Q. Okay. Let's go ahead and mark the three documents that you referred to in that paragraph now that we have it clear that it wasn't the Health Canada, it was the Taher article.

(Document marked for identification as Exhibit Neel-18.)

BY DR. THOMPSON:

Q. The first is the letter that you referred to as -- from the FDA to Samuel Epstein will be Exhibit 18.

DR. THOMPSON: The IARC Volume 93 published in 2010.

MS. SHARKO: No, no, no,

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you're marking your notes.

DR. THOMPSON: Oh, see you're looking after me.

MS. SHARKO: I'm watching out for you.

(Document marked for identification as Exhibit Neel-19.)

DR. THOMPSON: 19 then will be the -- will you all take all of these.

-- will be the IARC 2010 monograph on non-asbestiform talc.

(Document marked for identification as Exhibit Neel-20.)

DR. THOMPSON: And the third will be the Taher systematic review and meta-analysis that was commissioned by Health Canada. That's all I have with that one.

BY DR. THOMPSON:

Q. So let's go to your first opinion. That talc is chemically inert.

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What do you mean by chemically inert?
A. I mean it doesn't directly damage -- in the context of this statement it doesn't directly damage DNA. It doesn't cause DNA damage.
Q. Is it biologically inert in your opinion, or are you -- are you using those two terms interchangeably?
A. No, I'm saying the -- no, I'm not using those terms interchangeably.
Q. Okay.
A. In the -- in the context of -- you know, in the body it can cause granulomatous inflammation or granulomas. But that's not the kind of inflammation that's associated with carcinogenesis.
But it doesn't -- it's -- it's chemically inert in the sense that if you have it on the table, it's not highly reactive with, you know, typical substances. So --
Q. So --

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A. And if you put it on cells it doesn't damage DNA.
Q. Okay. So to you chemically inert here is being used as not directly damaging DNA?
A. Not directly or indirectly damaging DNA. And that's in the context of this statement. But it's also chemically inert in the sense that it's not highly reactive with most substances. So...
Q. Okay. So not directly or indirectly damaging DNA in the cell. And not reactive chemically --
A. With most substances.
Q. With most substances, okay.
But you would agree that it's not biologically inert?
A. No, not in certain locations. It can cause -- it's a foreign body and it can cause a foreign body reaction.
Q. In -- so that you -- you agree that talcum powder does cause an

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inflammatory reaction of some type in human --
A. It causes -- sorry.
Q. -- and animal tissues?
A. It causes granulomatous reactions. Some people would call that an inflammatory reaction. Some people would call it a foreign body reaction. Some people just call it a granuloma.
But it's not the kind of inflammation that Balkwill or Hanahan were referring to in terms of carcinogenesis.
Q. And it certainly causes an acute inflammatory reaction as well?
A. It causes granulomatous inflammation.
Q. When it's used for pleurodesis, what type of reaction is it?
A. It's a granulomatous and fibrotic response.
Q. Okay. So granulomatous and fibrotic response.
And what's your basis for

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your statement that that is not the type of response that Balkwill and others are talking about?
A. Because the type of -- I'm aware of the literature about inflammation and cancer. And that's typically type -- you know, the sort of infiltration with activated macrophages, infiltrated neutrophils. That's not the kind of thing you get in a chronic body reaction.
And there's -- and even more to the point, there's no association of granulomas with ovarian cancer that has been published to my knowledge.
Q. But can you direct me to a particular article?
A. I'd have to, you know, go back and look at my literature to give you a -- I can't give you that offhand.
But it's general knowledge that granulomas are not associated with ovarian cancer pathogenesis.
Q. But you do agree that

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granulomas and granulomas caused by talc are well reported in ovarian pathology?
A. No, I would not agree with that at all. Absolutely not.
Q. You are telling me that talc granulomas are not reported in ovarian tissue?
A. Not to my knowledge. And, in fact, the case -- the literature that I cited in my report, I'd have to pull out the exact references, reported talc particles in the ovary with no associated granulomatous inflammation.
Q. Have you looked at a GYN pathology textbook lately?
A. I would have no occasion to look at a GYN pathology textbook.
Q. Would it surprise you if virtually every GYN pathology textbook would have a section on foreign body granulomas including talc?
A. I would have to look at exactly what you're talking about.
Q. I didn't bring a textbook

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but I do have an example.
Do those opinions that, in your words, talc is chemically inert, apply to Johnson's Baby Powder in your opinion?
A. Yes.
Q. And apply to Shower to Shower I assume?
A. Yes.
Q. Would that opinion apply to fibrous talc?
A. As I said earlier today, I'm -- I'm referring to any of the talc that was used in the studies that I evaluated for the purposes of writing my report. So it does not say one way or the other fibrous talc. It has to do with the specific experiments that are cited in my report that have to do with talc and ovarian cancer pathogenesis.
Q. So it's fair to say that you don't have an opinion as to whether fibrous talc is chemically inert?
MS. SHARKO: Object to the

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form. Misstates the testimony.
THE WITNESS: Can you repeat the question?
BY DR. THOMPSON:
Q. Well, let me just ask it. Is -- is fibrous talc chemically inert?
A. I -- I have no specific opinion on fibrous talc. My opinions are -- are related to the talc that was used in the papers that I reviewed and the epidemiological studies that I reviewed. And whatever is in those products my opinion relates to.
Q. Okay. Is asbestos chemically inert, or do you not have an opinion?
A. I have an opinion -- it's -- it's not cellularly inert. But I don't have -- I don't have a great deal of detailed knowledge on asbestos pathogenesis. That's not the topic of my research and that's not the topic of my analysis for the purposes of this report.
Q. So for this case you are not

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going to be giving opinions as to the cellular effects of asbestos; is that fair to say?
A. That's correct.
(Document marked for identification as Exhibit Neel-21.)
BY DR. THOMPSON:
Q. Exhibit 21 is an article titled "Foreign Body Granulomas in Normal Ovaries." I don't want to spend a whole lot of time with this.
You can look over at -- it describes a study at Hopkins, published in Obstetrics and Gynecology, that ACOG Green Journal, that looked at 100 consecutive cases of oophorectomy for benign disease. And they found that, I believe it was 9 percent of normal ovaries had cortical granulomas containing a foreign body-type giant cell and associated with a foreign body which consisted of magnesium silicate that they postulated was talc or asbestos.

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Does that sound like a fair summary of this paper?
A. Well, I don't know. I'd have to sit here and read it to really be clear.
I mean, you know, I'm not going to be able to accept your conclusions without reading the whole paper.
Do you want me to read the paper?
Q. Probably not. Let's see if we can just find a summary statement that's not mine, that's the authors.
A. Well, I'm not going to agree until I read the whole paper. Because the summary statement would be their opinions of the data, not mine.
Q. Okay. Do you agree that this paper reports foreign body granulomas in normal ovaries from Johns Hopkins?
A. That's the title of, but I mean, just -- that's the title of the

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paper. But again I just want to -- just in casually pursuing it, cases, on the first page, it says, "Cases in which there were foci of reticular stroma with or without inflammation" -- oh, sorry.
Q. Yeah.
A. "Cases in which there were foci of reticular stroma with or without inflammation that have been classically referred to as 'cortical granulomas' but have been referred to as endometriosis by others."
And in cases, and then these giant cell ones which may be cortical -- which may be, you know, granulomas.
But there's -- it seems --
Q. Well, Group -- Group 3 --
MS. SHARKO: Let him finish. He said, "but there."
THE WITNESS: Group 3 says has been described -- I'm not a gynecological pathologist. I can't comment on whether that's really endometriosis or not.

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BY DR. THOMPSON:
Q. Well Group 3 had granulomas. Group 4 had a foreign body.
A. There's nothing in there that says that that's caused by talc.
MS. SHARKO: If we're going to use the paper, why don't you --
BY DR. THOMPSON:
Q. Okay. Go ahead and take -- go ahead and take a minute to review it.
A. All right. There's -- I mean there's no evidence that this is -- there's nothing that says that it's caused by talc.
MS. SHARKO: Wait. First, read the paper. Then she'll ask you a question. Okay. There's no question pending. I don't think.
DR. THOMPSON: I don't think so either. But I'm not sure.
MS. SHARKO: Okay. Well if there is, you'll ask it again.
BY DR. THOMPSON:
Q. So did this article report

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on foreign body granulomas that, when tested using computer-assisted x-ray analysis of the crystalline foreign body, they were determined to be composed largely of magnesium and silicone.
A. Yes. Okay. Well, that's what the paper says. I am not an expert in how one decides what a particle is. So I can't comment whether this is consistent with talc or not.
Q. Okay.
A. But I will -- can I finish?
I will notice that 44 percent of these patients had a previous laparotomy -- a previous laparotomy so that raised -- they could have gotten from talc from the talcum powder in the surgical gloves which was probably present at the time.
So this is -- you know, I don't think it's questionable that talc can cause granulomas. The question is whether perineal talc causes granulomas. And there's absolutely no evidence in

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this paper that I can see from my reading that perineal talc causes granulomas in the ovary.
Q. But talc can cause granuloma in the ovary, correct?
A. I think that's -- yeah, talc can definitely cause granulomas probably in many body cavities, but I just to -- can I also -- can I finish, please?
Q. There's no question on the table.
A. You just asked a question.
Q. Well, you answered it.
A. No.
MS. SHARKO: You can -- no. Finish your answer.
THE WITNESS: The finishing of my answer is that I think the relevant point is foreign body granulomas in normal ovaries, there's absolutely no evidence in these ovaries of pre neoplastic changes. So I think this actually strongly supports my argument. It

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doesn't argue against it.
BY DR. THOMPSON:
Q. Are there pre-neoplastic changes that can be observed in ovaries?
A. In ovaries, yes.
Q. What are those?
A. So some cortical inclusion cysts can show evidence of metaplastic change. But I -- they didn't just remove the ovaries. I assume they removed the fallopian tubes too. You don't need to just remove ovaries.
Q. You have no idea whether they did or not, do you?
A. Well, give me some time here. I don't know, but as a -- you know, as a gynecological oncologist, you would know that.
Q. And you're not a GYN pathologist as you just stated?
A. That's correct.
Q. Does the opinion about talc being chemically inert, would that apply to heavy metals like chromium, nickel, or

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cobalt?
A. As again, my opinions are based on and restricted to the talc that was used in the papers that I reviewed and epidemiological studies that I commented on in my report. So I can't comment on any of these other questions involving heavy metals or stuff like that.
Q. I understand. But I'm going to ask them regardless.
A. That's fine.
Q. So be patient.
A. I'm patient.
Q. So it's really irrelevant to you whether or not talcum powder products like Johnson's Baby Powder contain heavy metals?
A. It's irrelevant to me in the context of whether they cause ovarian cancer, because I'm basing my opinion on the biological experiments using said products and the epidemiological studies that included or were focused on mainly

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the use of said products.
Q. And it's irrelevant as far as a biologically plausible mechanism as well. Would you agree with that statement?
A. My evidence -- my statement on biological plausibility is based on the purported evidence supporting the case that talc is involved in ovarian cancer, based on biological experiments, or the absence of proof in those experiments that talc causes any evidence of ovarian cancer.
So it's based on that.
Q. And are chemicals that are known to be contained in Johnson's Baby Powder as fragrances, would your opinion that they're chemically inert also be irrelevant?
A. I'm not aware of what chemicals are or are not in Johnson's Baby Powder, so I can't comment on that one way or the other.
Q. So you don't have an opinion

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as to whether styrene, cumarin, eugenol, d-limonene, p-Cresol, musk ketone, and benzophenone, which are all possible or known carcinogen, would render talcum powder not chemically inert?

MS. SHARKO: Object to the form of the question.

BY DR. THOMPSON:

Q. Did you understand the question?

A. That was sort of a double negative.

Q. It was.

A. I'm trying to parse it. And, you know --

Q. Fair enough.

A. -- my blood sugar dropped after lunch.

Q. Right.

A. It's hard enough.

Q. Are chemicals such as -- that are known to be possible or suspected carcinogens -- are chemicals like styrene, cumarin, eugenol,

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d-limonene, p-Cresol, musk ketone, and benzophenone chemically inert?

MS. SHARKO: I object to the form of the question. It lacks foundation and it assumes facts not in evidence.

THE WITNESS: I am not a toxicologist. So I can't comment on any of those specific chemicals.

BY DR. THOMPSON:

Q. So --

A. And I don't have any knowledge as to whether or not they're in Johnson & Johnson products. So I can't comment.

Q. So you would not be giving any opinions as to whether those chemicals that I just named off were chemically inert or not?

A. No, I will not be giving an opinion on that.

Q. Did you perform any studies, experiments to test whether talcum powder

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products are chemically inert?

A. No, I --

MS. SHARKO: Objection. Asked and answered.

THE WITNESS: As I explained this morning it's impossible for me to do any experiments under the conditions of my contractual obligation to be an expert witness in this case.

So, no, I did not perform any experiments, nor do I plan to.

BY DR. THOMPSON:

Q. Can you refer me to studies that explicitly state that Johnson's Baby Powder and Shower to Shower products are chemically inert?

A. No, I cannot refer you to studies that state that.

Q. Regarding your opinion, talc does not cause mutations, you describe in your report that cancer is a disease that involves mutations and specific genes, right?

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A. Yes.

Q. And --

A. Where are we in my report, please, so I can follow along.

Q. We're still on Page 14 with those opinions --

A. Oh, okay. All right.

Q. -- opinions in bold?

A. I see. Sorry, yeah.

Q. Do you agree that carcinogens can be genotoxic or non-genotoxic?

A. Promoters can be -- again, it comes down to a little bit of a semantic argument. I mean, primary carcinogens are mutagens. Some people would -- as I said earlier this morning, some people would class tumor promoters that are not direct mutagens, as carcinogens.

So I prefer to discriminate between initiating events and promotion events.

Q. With a definition of

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carcinogenesis that includes initiation and promotion, can you agree that carcinogen can either be genotoxic or non-genotoxic?
A. Yes.
Q. But your opinion is for initiation purposes, that carcinogens have to be genotoxic; is that correct?
A. Yes.
Q. And you are 100 percent confident in that opinion?
A. They have to be directly or indirectly genotoxic. They have to cause damage to DNA, otherwise they are not carcinogens.
Q. And what do you -- what do you mean by indirectly genotoxic?
A. If they indirectly cause reactive oxygen generation and the reactive oxygen species cause the -- cause the mutations, that would be indirectly genotoxic.
Q. Wouldn't -- wouldn't some scientists refer to that indirect

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mechanism as non-genotoxic?
A. I -- I can't comment on what other scientists would refer to. If you want to give me a specific literature reference I can help out on that.
Q. Okay. I may need some help with that one. Because I believe that I've seen that in the literature.
And does the opinion that talc does not cause mutations apply to Johnson's Baby Powder?
A. It applies -- my opinions again -- I'm sorry to be repetitive -- but my opinions refer to any of the studies, epidemiological or biological, that included Johnson & Johnson baby -- baby product and baby -- baby shower, and to talc used in said studies that was not from Johnson & Johnson.
Q. You would agree that your opinion that talc does not cause mutations is not based on epidemiological literature, right?
A. I don't believe that

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epidemiological studies can address that question directly.
Q. That -- that was -- yeah. That answered my question. Thanks.
A. I -- well, not standard epidemiological studies. New types of epidemiological approaches could in principle do that. But that would be a new approach.
Q. So you're really referring to the cellular studies when you give the opinion that talc does not cause mutation, correct?
A. Yes. And the fact that it was tested in the Ames test for example, and other standard toxicity tests.
Q. I'll get to that in a minute.
Does that opinion apply to asbestos?
A. I have no opinion specifically on asbestos, as I told you earlier.
Q. And same thing with talc

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fiber or fibrous talc?
A. Again, as I said earlier, my comments are not relevant to that -- or not --
Q. How about heavy --
A. My comments are not germane to -- I have no comments on that. Sorry.
Q. And -- no apologies needed.
And how about the chemical carcinogens that are possibly in Baby Powder?
A. I --
MS. SHARKO: Object. Object to the form of the question. Lacks foundation.
THE WITNESS: So, same -- same answer as I said before. My -- my opinions are restricted to Johnson & Johnson products, effects on cellular or animal models in the context of mutation generation.
BY DR. THOMPSON:
Q. And did you perform any

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studies testing whether talcum powder products cause mutations?
MS. SHARKO: You know, asked and answered. This is about the seventh time you've answered that.
DR. THOMPSON: The question has not been --
MS. SHARKO: He has not done any studies other than research.
DR. THOMPSON: I'm -- but I'm allowed to ask about a test for mutations. It's not the same question.
BY DR. THOMPSON:
Q. Go ahead.
A. I have performed no studies on Johnson & Johnson Baby Powder, baby showers, any Johnson & Johnson product or any form of talc in my own laboratory, because I am prohibited from so doing as a consequence of my institution's conflict of interest rules.
Q. Can you refer me to any study that explicitly states that

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Johnson's Baby Powder and Shower to Shower don't -- do not cause mutations?
A. Not offhand, no.
Q. Your next opinion is that talc is not genotoxic. And you state as support of that, that -- on Page 16, that "talc is universally acknowledged to be non-genotoxic in standard mutagenesis assays."
What assays are you referring to?
A. These are the genes test which is a test of mutations. I forgot the name of the test, but it's a test of chromosomal segregation defects.
Q. And you --
A. Actually, I just want to state that, again, all of the regulatory agencies agree with that statement, including the FDA, and -- well, certainly IARC.
Q. Do you agree that standard genotoxicity tests are not reliable for the determination of the genotoxicity of

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particles and fibers?
MS. SHARKO: Wait. I couldn't -- somebody coughed and I couldn't hear the question. Can you say it again?
BY DR. THOMPSON:
Q. Do you agree that standard genotoxicity tests are not reliable for the determination of the genotoxicity of particles and fibers?
A. I'm not an expert on toxicology. So I don't have a lot of experience with genotoxicity of particles and fibers.
But my point was that it's not genotoxic, and that I stand by.
Q. So you're saying it's not genotoxic, but you don't have any experience with genotoxicity of particles and fibers?
A. No, I'm saying that the standard genotoxicity assays were done on talc and it's not genotoxic. Scientists reach conclusions based on assays and

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experiments, not based on suppositions or hypotheses.
Q. My question was, are you aware that the genotoxicity testing is not accurate with particles and fibers?
MS. SHARKO: So I object to the form of the question. That's not what you asked him. If that's your question, he'll be happy to answer that.
DR. THOMPSON: Okay. I'll ask that question then.
BY DR. THOMPSON:
Q. Are genotoxicity tests accurate when testing particles and fibers?
A. Accurate in terms of what?
Q. Reliable.
A. Reliable in terms of what?
Q. Well, your statement is "talc is universally acknowledged to be non-genotoxic in standard mutagenesis assays."
And I'm asking you, do you

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have knowledge regarding the reliability of those tests in products that are -- have particles or fibers?

A. The tests are extremely reliable. They measure genotoxicity. Whether you use a particle, fiber, any chemical, they measure genotoxicity.

Q. Okay.

A. That's not -- the issue is whether there are other types of assays that might yield a different result, and I have no expertise on particles and fibers beyond the fact that standard assays of genotoxicity do not show any mutagenesis.

And that's -- that's true to the best of my knowledge.

(Document marked for identification as Exhibit Neel-22.)

BY DR. THOMPSON:

Q. This is -- I just marked Exhibit 22. It is an article titled "Mechanisms of Genotoxicity of Particles

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and Fibers."

Have you seen this article before?

A. No.

Q. Do you -- would you like to take a minute to look through it?

A. I mean it will take me at -- at least an hour to read this paper.

Q. Okay. Well, we won't spend an hour. Let's just go to the chart --

MS. SHARKO: Well, no, it's not fair to ask him about it if he's not seen it before or read it.

DR. THOMPSON: Okay. We'll go off the record for an hour then. It will be fine.

MS. SHARKO: No, why should we go off the record? You want to use this --

DR. THOMPSON: Because that's what we've always done when an expert needs longer time to go through an article than seems to

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be reasonable.

MS. SHARKO: No, I -- I disagree. I don't know that that's what we've always done. If you want to use your deposition time to have him read it, then we're not going off the record.

DR. THOMPSON: I'm going to use my deposition time to have him look at the chart on Page 70.

THE WITNESS: I can see the chart.

BY DR. THOMPSON:

Q. Is that chart consistent with what your opinions would be regarding genotoxicity of particles and fibers?

A. As I said, I'm not an expert in particle and fibers. And I have no comment on this paper because I would have to really read the entire thing. And also I would have to go through the literature and see what's been written since 2012 -- 2002 on this subject.

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Again, 2002 is a long time ago in cancer biology. And I have no knowledge offhand whether this is even considered to be state of the art.

Q. Okay. All right. We'll move on.

A. So I have no comment.

Q. We'll move on. Did you perform any studies to test whether talcum powder products are not genotoxic?

MS. SHARKO: Objection. Asked and answered.

BY DR. THOMPSON:

Q. You can answer again.

A. As I said --

Q. You don't have to give the explanation. Just say yes or no.

A. No.

MS. SHARKO: No, you should give a complete answer. You can't just keep asking a question and hope for a sound byte. He hasn't done any studies. We stipulated that.

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MS. O'DELL: Object to the form, Susan.
DR. THOMPSON: Hey, I don't need the -- I do not need the speaking objection.
MS. O'DELL: Or coaching the witness.
MS. SHARKO: He clearly doesn't need coaching, especially when you've asked the same question like ten times.
MS. O'DELL: Not that that's restrained you at all. It's coaching the witness. Object to form is the appropriate objection.
BY DR. THOMPSON:
Q. Can you refer me to any studies that explicitly state that Johnson & Johnson Baby Powder and Shower to Shower are not genotoxic?
MS. SHARKO: Objection. Asked and answered.
THE WITNESS: I think you asked that already, but no.

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BY DR. THOMPSON:
Q. And your opinion is that, on Page 14, talc does not cause inflammation in the female genitourinary tract. What are you basing that opinion on?
A. I just want to clarify. I was referring -- I was a little -- not very clear in saying I'm referring to the type of inflammation that usually is associated with cancer.
So talc will potentially cause a foreign body granuloma in the female genital tract. But there's no evidence that foreign body granulomas are associated with ovarian cancer pathogenesis.
So I may have been a little loose with my terminology with that particular part. But the point is that talc does not cause precancerous inflammation or cancer-promoting inflammation in the female genital tract. That's my point.
Q. Is that referring to female

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humans or would that include animals as well?
A. That would refer to both.
Q. You do agree, then, that talcum powder is known to be inflammatory in other tissues?
MS. SHARKO: Object to the form.
THE WITNESS: You have asked that in a different way before. But let me try to give the same answer so that it's clear.
If you inject talc into a body cavity, it can cause a foreign body reaction, which some people cause -- call granuloma -- granulomatous inflammation.
So yes, talc can cause foreign body reactions or granulomas.
However, to my knowledge, there is no evidence that talc causes other -- causes cancer-associated inflammation,

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particularly in the female genital tract where the direct experiment has been done and indirect experiments have been done. And the evidence, including some evidence that you showed me, is inconsonant with the idea that it's causing cancer-promoting inflammation.
BY DR. THOMPSON:
Q. And you're familiar with the animal studies done with talc, correct?
A. Which animals studies? I'm familiar with several animal studies. If you want to cite a particular one, I'm happy to talk about it.
(Document marked for identification as Exhibit Neel-23.)
BY DR. THOMPSON:
Q. I'll mark as Exhibit 23 as the Keskin rat study. Have you seen this one, Dr. Neel?
A. Yes, I cite that in my

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report.
Q. Okay. And the Keskin study -- did find that the rats that were exposed to talc had evidence of foreign body reaction and infection along with an increase in inflammatory cells in the genital tissues, right?
A. So can we be -- let's -- let's just go through the findings actually on page -- the first page. "In both groups exposed to talc, evidence of foreign body reaction" --
MS. SHARKO: Slow down. Slow down.
THE WITNESS: Sorry.
-- "and infection along with an increase in inflammatory cells."
So again, foreign body reaction I've already stipulated can be caused by talc. However, the infection causes the inflammation.
So I mean, these rats got

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infected. So infection will cause inflammation. But talc is not known to cause infection, as far as I know.
So this study is not relevant to the issue, except for the fact that it does cause granulomas, which was seen in other studies.
BY DR. THOMPSON:
Q. So you think that the infection is -- that resulted in these animals were completely unrelated to the talc?
A. I can't comment on what the sterile technique was in this laboratory or what other agents they were exposed to in this laboratory.
But I think that it's not alleged as far as I understand that talc causes infections as part of the plaintiffs' case.
Q. So you don't know one way or the other, as far as this study, where

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the infection came from, correct?
A. No. But I do know that infections cause inflammatory cells to come there. So you can't conclude anything about the nature of the inflammation. If you have an infection, you will definitely get white blood cells coming in, as any first year medical student knows.
Q. Are you familiar with the Hamilton study?
A. Yes.
Q. Another rat study.
(Document marked for identification as Exhibit Neel-24.)
BY DR. THOMPSON:
Q. And in this study with rats --
MR. ZELLERS: Is this Exhibit 24?
DR. THOMPSON: I'm sorry. Yes, Exhibit 24.
BY DR. THOMPSON:

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Q. The treated animals showed focal areas of papillary change on the surface epithelium, correct?
A. That's what they reported, yes.
Q. The authors did not conclude that the papillary changes represented first stage in development of a surface papillary epithelial neoplasm, right?
A. Excuse me? Can you repeat the question.
Q. Yeah, the authors --
A. And what review? Refer me --
Q. Well, let's just -- let's just read the authors' conclusions.
A. Sure.
Q. We'll just leave it at that one. I can't find my spot.
You mentioned earlier that you did not know why the FDA removed powder from exam and surgical gloves, right?
A. I didn't know that the FDA

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did it, and I certainly didn't know why they did it.

(Document marked for identification as Exhibit Neel-25.)

BY DR. THOMPSON:

Q. Exhibit 25 is the FDA register.

MR. ZELLERS: Do you have copies?

DR. THOMPSON: Oh, I do. Sorry.

BY DR. THOMPSON:

Q. Beginning on the bottom right of that first page, "Banned devices, powdered" -- sugar -- "surgeon's gloves, powdered patient examination gloves and absorbable powder for lubricating surgeon's glove."

So does that tell you that the FDA banned powder use on gloves?

A. Sounds like it.

MS. SHARKO: But again, he hasn't seen this. If you want to

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--

DR. THOMPSON: Well, he can tell me if he needs to -- he can tell me if he needs to see it.

He doesn't even know how -- what my question is going to be.

The first was what was the title of the regulation.

THE WITNESS: The title is "Banned devices: Powdered surgeon's gloves, powdered patient examination gloves, and absorbable powder for lubricating a surgeon's gloves."

BY DR. THOMPSON:

Q. So I -- I read it correctly too, right?

A. I think so.

Q. And this was published December 19th of 2016, right?

A. Oh, I'm sorry, you're asking? December -- where does it say where it's published?

Q. At the top of the page.

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A. Yes. December 2016.

Q. And in the first paragraph on purpose, in the executive summary the document states, "However" -- well, sorry about that.

"Various types of powder have been used to lubricate gloves so that wearers could don the gloves more easily."

MS. SHARKO: Wait, where are you?

THE WITNESS: The bottom --

DR. THOMPSON: The bottom of the first paragraph under executive summary, "Purpose and coverage of the final rule."

BY DR. THOMPSON:

Q. "However, the use of powder on medical gloves presents numerous risks to patients and healthcare workers, including inflammation, granulomas and respiratory allergic reactions."

Did I read that right?

A. You read it right. But it's

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a poorly written sentence, so it's not clear what refers to what.

Q. But it states that inflammation was -- and granulomas were at least part of the reason why powder was removed from surgical gloves and examination gloves, right?

A. So the way the -- the way the sentence is written is not very accurate. So it's not clear whether they are saying inflammation of a different type and the granulomas. Or whether they're -- they're basically saying they're both saying the same thing.

And it's also not saying whether the risk is to the patient or to the healthcare worker. And it's also not saying that it involves talc.

So it's a very poorly written sentence that doesn't allow me to offer a very precise opinion which scientists like to do.

Q. Okay. You cite I believe the Heller study as evidence that talc

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does not have an inflammatory effect on the ovaries, right?
A. I cite two studies. But one of them is Heller, yes.
Q. Are you aware that Heller only looked at one specimen out of 24 histologically?
A. I'd have to go back and look at the paper again.
Q. If Heller only looked at one specimen, would that be evidence of what was in the other 23 specimens?
MS. SHARKO: Can we get a copy of Heller? Please?
(Document marked for identification as Exhibit Neel-26.)
BY DR. THOMPSON:
Q. This will be Exhibit 26, Heller paper, "The Relationship Between Perineal Cosmetic Talc Usage and Ovarian Talc Particles."
MS. SHARKO: Thank you.
BY DR. THOMPSON:

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Q. And I'm looking at the last paragraph of the results section, Dr. Neel.
And it says, "In one subject we studied both ovaries. On the right side we detected no talc. On the left side" -- "by electron microscopy and 556 particles by light microscopy. And on the left side we detected 1,669,000 particles per gram of wet weight by electron microscopy and six particles by light microscopy.
"Hematoxylin and Eosin stained slides from the analyzed sections of tissues were examined. There was no evidence of response to talc such as foreign body giant cell reactions or fibrosis in the tissue."
A. It's -- I mean, it's not clear to me whether they only looked at those, at the sections from the -- the one subject above or not. Or whether they looked at all of them.
Q. Do you see anywhere in the

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paper that they looked at any sections using H&E light microscopy besides this one --
A. It's not clear from the way this is written that that's the only -- that they are saying that it -- from -- that those are the only analyzed sections. But, you know.
Q. But -- but you can conclude from your reading of this that Heller found no inflammatory reaction in the ovaries of cells with -- of -- in the ovaries of these subjects that they found talc?
A. Well, they don't report on it, so it's not evidence that there is inflammation in the ovary.
Q. Well, you cited this paper, right?
A. Yeah, I did cite to it --
Q. For that purpose?
A. Yeah. I said that there was no evidence.
Q. And you'll agree that there

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is no evidence of more than one being looked at, right?
A. As I said, I can't tell from the way that's written whether it was all of them or not. The major point for citing this was that there was no correlation between reported perineal talc use and the presence of particles assumed to be or -- or argued to be talc in the ovaries. That was the major reason for citing it.
Q. While we are on --
A. We already have direct evidence on the animal studies about what talc does in ovaries.
Q. You cited the paper.
A. I did and I said --
Q. Okay.
A. -- that they argued strongly that perineal talc use does not accurately reflect potential exposure. And I stand by that statement. That's exactly what the paper concludes.
Q. While we are on the Heller

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paper.
Do you intend to give opinions as to whether perineal talc powder can migrate or be transported to the distal fallopian tube, ovary or perineal cavity?
A. I intend to say that the evidence is inconclusive.
Q. So you will say -- you will say that there is evidence on both sides?
A. I say the preponderance of the evidence is negative.
Q. What do you use for the preponderance of the evidence being negative?
A. The best -- the best study is one that was done in monkeys by Whelan. All of the other studies are potentially confounded by artifact.
Q. Is -- is it plausible that talcum powders -- talcum powder applied to the perineum can reach the fallopian tube, ovary and perineal cavity?
A. Is it plausible? I think

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it's unresolved. I can't say it's plausible or implausible. It's unresolved. It's -- it's unresolved. The strongest evidence says no.
Q. And you cite as -- the -- as part of your opinions, this FDA citizen's response letter, correct?
A. Mm-hmm.
Q. And it's marked as exhibit something.
I didn't write it on the thing.
If you go to the --
MS. SHARKO: Go to exhibit something?
BY DR. THOMPSON:
Q. Give it -- go to exhibit something and we'll take a break after.
MR. ZELLERS: It's 18.
DR. THOMPSON: Exhibit 18. Thank you, Mr. Zeller.
BY DR. THOMPSON:
Q. And on Page 5, I'm reading the paragraph that starts with while

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there exists.
"While there exists no direct proof of talc and ovarian carcinogenesis, the potential for particulates to migrate from the perineum and vagina to the perineal cavity is indisputable. It is, therefore, plausible that perineal talc and other particulate that reach the endometrial cavity, fallopian tubes, ovaries and peritoneum may elicit a foreign body type reaction and inflammatory response that in some exposed women may progress to epithelial cancers.
"However, there was no conclusive evidence to support causality."
MS. SHARKO: There has been.
DR. THOMPSON: "Has been no conclusive evidence to support causality."
BY DR. THOMPSON:
Q. So even though the FDA determined that the potential for the

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particulates to migrate is indisputable, you're still saying that the preponderance of the evidence based on one monkey study is against it?
A. Well, it's not one monkey study, first of all. It's two monkey studies. And one --
Q. But by the same -- by the same Johnson & Johnson consultant, right?
A. He's -- I don't know that they're a Johnson & Johnson consultant.
Q. Did you look at the conflict of interest disclosure?
A. No, I didn't. But it's -- the study was done in the more accurate way than the other two studies. And it actually produced very clear evidence of potential confounding artifact in the -- in the studies that have been done before.
Q. So --
MS. SHARKO: Wait. Let him finish.
THE WITNESS: So the fact is

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that one very well-designed study beats multiple poorly designed studies in science. It's not a plebiscite.

BY DR. THOMPSON:

Q. You're saying that two monkey studies by a Johnson & Johnson consultant outweigh a vast body of literature on various substances, including particulates being transported, migrating to the ovaries, to reach your conclusion that the preponderance of the evidence is against migration or transport to particles?

MS. SHARKO: I object to the form of the question. Lacks foundation.

THE WITNESS: You haven't provided me with any -- vast literature? You provided me with two poorly designed studies. So I don't know what you're talking about. If you want to show me other studies, I'll be happy to

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read them and give my opinion on them.

However, it is well known that particle -- that radioactive, you know, materials can leach off of albumin particles. And also the study showing that carbon black is present -- it is true that the Egli study did not use -- did not do a control where they just used the solutions themselves.

So again the point raised by Whelan is a reasonable point, whether he's a consultant for Johnson & Johnson or not. Science is science. It doesn't matter who does it.

BY DR. THOMPSON:

Q. Are the FDA not scientists that say it's indisputable?

A. I don't know what -- the FDA doesn't reference anything here, so I can't comment on the studies. Maybe they

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know of something that I don't know. But what I'm saying is this -- this -- this -- you can't just make a statement without referencing it and then assume that -- and assume that scientists are going to take it at face value. We have to see the evidence. That's what we work with, evidence.

Q. You really need evidence to show that something can go from the perineum through the genital tract?

A. Well, sperm can go there. But they have -- but they have, you know, flagella. I'm not aware of talc having flagella.

Q. Okay. Are you aware of the sperm studies that show dead sperm and sperm particles can migrate through the genital tract?

A. I don't know what studies you are talking about. But if you want to give me studies --

Q. Okay. Let me get them.

A. -- I'll be happy to look at

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studies and --

Q. We'll take a break and get them.

A. -- see if I think they are reliable.

Q. Okay. We'll take a break and come back and go through the studies.

THE VIDEOGRAPHER: The time is 2:10 p.m. Off the record.

(Short break.)

THE VIDEOGRAPHER: We are back on the record. The time is 2:28 p.m.

BY DR. THOMPSON:

Q. Dr. Neel, has your research over the last 30 years -- plus years, had anything at all to do with the physiology of the female genital tract?

A. No.

Q. Have you written any papers that have anything to do with the physiology of the female genital tract?

A. No.

Q. Prior to being contacted by

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the lawyers in this case, did you have any knowledge of the literature regarding the potential migration or transport of particles through the female genital tract?

A. Only sperm.

Q. Only?

A. Only sperm.

Q. Only sperm. And were you aware of the literature regarding sperm particles or dead sperm being transported through the genital tract?

A. No.

Q. Were you aware of the literature that sperm moved more quickly through the genital tract than would be expected just from the motility of the flagella?

A. I'm not aware of any studies on that issue.

Q. Did you have any knowledge of the concept of the uterine peristaltic pump, which actually facilitates the migration or transport of particles?

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A. Not that I recall.

Q. Would you agree that a gynecologist or GYN oncologist would have a greater understanding of the migration or transport of particles through the genital tract?

A. They might have a greater understanding of what's published in textbooks, but they wouldn't necessarily be any better than I am at evaluating literature on the subject.

Q. But they would have more firsthand knowledge and experience --

A. As I said.

Q. -- in their practice, wouldn't they?

A. I don't think the practice of gynecological oncology addresses the issue of the migration of particles through the genital tract. So I don't think so necessarily, no.

Q. They would be more familiar with the anatomy of the genital tract, right?

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A. I think anybody who has gone to medical school is pretty familiar with the general anatomy of the genital tract.

Q. You don't think gynecologists have a more in-depth understanding of anatomy than other non-GYN doctors?

A. I think they do have a more detailed understanding of anatomy. That doesn't necessarily mean they have a more detailed understanding of anatomy that is necessary to make a conclusion about particles moving through the genital tract. That doesn't require a very complex surgical description of the genital tract.

Q. Do they have more understanding of the physiology of the reproductive tract?

A. I would hope so, yeah.

Q. Let's go to the Taher article. That would be Exhibit --

A. 20.

MS. SHARKO: 20.

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BY DR. THOMPSON:

Q. 20. And this -- this is the article that you were referring to in your report when you referenced Health Canada, right?

A. Yes. And now I -- now I recall where my statement came from in my report.

So if you look at the bottom of Page 1, it says, "For information contact Dr. Donald R. Mattison." It has his contact information. And it says, "Materials submitted to Health Canada."

So that was where I got the information that this was commissioned by Health Canada. I may have misinterpreted that. But that's where I got the information from. And I think there's an allusion to that also in the end. But I'd have to look through it. If you want me to, I will.

Q. Let's go to the chart on Page 26. And --

A. Hold on. I'm not there yet.

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That in the middle of a chart. It's the middle of the chart. Do you want to just --

Q. 26.

A. -- on Page 26.

Q. I want to look at the --

A. It continues on three pages.

Q. Yeah, I want to look at the biological plausibility --

A. Okay.

Q. -- section of the chart on Page 26.

And this Taher article states, under biological plausibility, "Particles of" -- "of talc appear to migrate into the pelvis and ovarian tissue causing irritation and inflammation."

Do you agree that that's a biologically plausible mechanism?

A. If the data supporting it were convincing, or even close to convincing, yes. But they are not.

And so I agree that

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conceptually that would be a reasonable mechanism. But they don't have -- the -- the actual studies are poor or nonexistent in terms of evidence.

Q. So your opinion, with that first statement, is you would need convincing evidence to have that be a biologically plausible mechanism?

A. I would need some scientifically credible evidence. All of the publications that I have -- that I have found that address this issue, and I'm happy to review other ones with you, all of the ones that I've found are really poor or they don't say that this is true.

Q. The second one, bullet point under biologically -- biological plausibility says, "Transport of talc via perineal stroma and presence in ovaries documented."

Do you agree that that is a biologically plausible part of the mechanism?

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A. So actually, if you look at the report somewhere else, it says that data on talc migration are inconsistent. So we'll have to go through the entire report to find that sentence.

But I don't think that you should take this chart or this table and state that as what the conclusion of the report is because it's out of context.

Q. Well, this is Dr. Taher's chart that is titled "Summary of Evidence."

A. Well, Dr. Taher also wrote that data on talc migration were inconsistent. So we can look through it and find out where that is, but I wouldn't put that in my report unless I saw it in this paper.

And Dr. Taher, I believe, is an epidemiologist. So he -- he's not really qualified to comment on biological plausibility based on cellular mechanisms anyway.

Q. So in your opinion, an

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epidemiologist is not qualified to testify as to cellular mechanisms?

A. Unless they are trained in cellular molecular biology as well, no.

Q. Okay. Do you disagree with the authors of the Taher paper?

A. What -- which parts of the authors they state in these statements?

Q. In this biological plausibility section.

A. I think that, yes, I do disagree with several of the statements in the biological plausibility section. Including the particles of talc appear to migrate to the pelvis and ovarian tissue, I think that remains unclear.

The fact that they cause irritation and inflammation. Particles of talc cause granulomas. There's no -- I don't know what irritation means. That's not a scientific term as you know.

And transport of talc via perineal stroma. I don't really know what perineal stroma means. Stroma

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actually is something that is subepithelial, so I don't know what that refers to. It's probably a misprint.

And presence in the ovaries documented. We've already discussed presence in the ovaries. But we haven't established that that is from transport.

Q. Could -- could evidence be inconclusive and both sides be plausible in your mind?

A. Can evidence be inconclusive and plausible at the same time? No.

Q. So if you have differing evidence on an issue, neither one could be plausible, is that your opinion?

A. No. Good evidence is plausible. Bad evidence is not. It's not a plebiscite. It's not an election. It's not like you get a bunch of people on one side and a bunch of people on the other, and you take testimony and -- and you tally up who gets what.

It's which evidence is plausible scientifically and that has to

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do with the quality of the data and the convincingness of the evidence. And that's not a plebiscite.

Q. So -- so you don't see a situation where the evidence could be credible on both sides of a scientific question?

A. If two people do the same experiment and they get different results, and neither one -- and there -- if two people do the same experiment and they get different results, one of them is right and one of them is wrong.

That's the essence of science. It's empirically observable and reproducible. So that's my opinion.

Q. So science is either right or wrong?

A. Or good or bad. Yes.

Science is either right or wrong by definition.

Q. You mentioned earlier that you are at least aware of the treatise commissioned by the National Academies of

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Science, Engineering, Medicine, and supported by the CDC, that was a book actually titled "Ovarian Cancer: Evolving paradigms in research and care."

Correct? Do you remember that?

A. You'll have to show --

MS. SHARKO: Object to the form of the question.

THE WITNESS: I said I had seen several, you know, summary reviews.

You'd have to show me the exact.

BY DR. THOMPSON:

Q. I will. I just -- I had remembered this morning that you were aware that this had been published. But I'm going to show it to you regardless.

(Whereupon, a discussion was held off the record.)

DR. THOMPSON: 27. Exhibit 27 will be "Ovarian Cancer: Evolving paradigms in

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research and care."

(Document marked for identification as Exhibit Neel-27.)

BY DR. THOMPSON:

Q. I did not print the whole book. I did print the entire chapter that I'm going to be referencing.

And --

MR. ZELLERS: Margaret, do you have one more of them?

DR. THOMPSON: I don't. I just -- oh, I do. I'm sorry.

MS. SHARKO: Do you have a paperclip? May I have that paperclip?

DR. THOMPSON: You are so demanding.

MS. SHARKO: Thank you.

BY DR. THOMPSON:

Q. And on page little Roman numeral ix preface, "This congressionally mandated report sponsored by the Centers for Disease Control and Prevention

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assesses the state of research on ovarian cancers from multiple perspectives and by multiple disciplines."

Did I read that right, the first sentence of --

A. Yeah.

Q. -- of --

A. I have not seen this report before, so --

Q. Okay.

A. -- just so you know.

Q. And this paper -- or this book actually, was authored by a committee of -- approximately 15 authors, correct?

A. Yes.

Q. And this book also was reviewed by another, it looks like ten or so reviewers, correct?

A. Yes.

MS. SHARKO: Just for the record, we don't have a book in front of us. We have --

DR. THOMPSON: Okay. The

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chapter from the book.

MS. SHARKO: Okay. Thank you.

BY DR. THOMPSON:

Q. Let's go to -- and this, the chapter that I did take from this book is titled "Prevention and Early Detection."

And if you'll go to Page 110. The topic heading --

A. Okay. I see the numbers now.

MS. SHARKO: And the witness should have the opportunity --

DR. THOMPSON: Susan, we don't need any speaking objections. How many times do we need to tell you that?

MS. SHARKO: Well, I'll ignore --

DR. THOMPSON: And there -- the witness is perfectly --

MS. SHARKO: I'll ignore your rudeness. It's not an -- it's not -- it's not an objection.

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It's an observation.

DR. THOMPSON: Well, we don't need your speaking observation. Dr. Neel can -- can let me know if he needs time to look at whatever it is I'm showing him.

BY DR. THOMPSON:

Q. Dr. Neel, this section on Page 110 titled "Inflammation" is under the heading behavioral and inflammatory risk factors.

And I'm going to read the first part of this paragraph. "Studies of the inflammatory marker C-reactive protein suggest a possible association between inflammation and an increased risk of ovarian cancer." There are two cites.

"Other specific inflammatory factors have also been associated with ovarian cancer. A meta-analysis reported that exposure to asbestos was associated with a 77 percent increased risk of

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ovarian cancer mortality," citing Camargo, "and the International Agency for Research on Cancer determined that there was sufficient evidence to support a causal relationship between asbestos exposure and ovarian cancer," citing Straif.

"This has led to studies of talc use, which is chemically similar to asbestos and can cause an inflammatory response. The use of talcum powder has been associated with a 20 to 30 percent increased risk of ovarian cancer, although it has been shown" -- "show to vary by histologic subtype."

Did I read that correctly?

MS. SHARKO: No. You left out the word "perineal."

THE WITNESS: Yeah, perineal talc.

BY DR. THOMPSON:

Q. Okay. Thank you. Anything else?

A. I think you read that

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correctly.
Q. Okay. So the state of the art committee that was commissioned by the National Academy of Science Medicine -- are you familiar with that organization?
MR. LOCKE: Objection.
THE WITNESS: Yes. I hope to be in it.
What was that?
MR. LOCKE: I just said objection.
THE WITNESS: Okay.
BY DR. THOMPSON:
Q. And it has a reputation certainly, correct?
A. Yes. I know most of the people on this panel.
Q. Do you know -- do you know the authors?
A. I know several of them.
Q. Or the researchers?
A. Several of them, yes.
Q. And it's my understanding

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that the authors of this treatise included not only GYN oncologists, but epidemiologists, molecular biologists, and others so that it would be a comprehensive report.
A. Yes.
Q. Is that your understanding as well?
A. Mm-hmm.
MS. SHARKO: Object to the form.
BY DR. THOMPSON:
Q. And it was also meant to be a state of the science in ovarian cancer research treatise.
And this was published in 2016, I believe; is that right?
A. I think so.
MS. SHARKO: Object to the form.
BY DR. THOMPSON:
Q. So at least these researchers had the opinion that inflammation was a risk factor for

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ovarian cancer and that asbestos and talcum powder were associated with an increased risk; is that correct?
MS. SHARKO: Objection to form. Lacks foundation.
THE WITNESS: There are several questions there. Can you break them up?
BY DR. THOMPSON:
Q. Okay. These authors included inflammation under behavioral and inflammatory risk factors, correct?
A. I think that you have to understand how to read the scientific literature. "Suggests a possible association" is a very weak statement. That means they suggest. That doesn't mean they establish. "Suggests a possible association between inflammation and increased risk of ovarian cancer."
So no, it's not as strong as you made it out to be Number one.
Number two is I've read the Poole, et al., paper and I have read the

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subsequent papers by Poole and others. And the association between inflammation and increased risk of ovarian cancer, it doesn't distinguish between whether the inflammation is a marker of existing ovarian cancer or the inflammation is a cause of cancer, which has been what we discussed all morning.
So I don't really think that this statement is in any way contradictory to anything that I've said this morning.
As to the statement about asbestos and ovarian cancer, I've already said that I don't really have an opinion. I haven't had time or wasn't charged with doing an extensive analysis of ovarian cancer and asbestos.
So I really don't think that I should comment on this statement. But it doesn't really review the evidence. Just to be -- just to point out that this statement does not review the evidence, it simply cites previous conclusions. So

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it really doesn't analyze the case any more than those original papers did.

As for the statement of talc, it cites, you know -- it cites two studies that are, again, I think, both case-control studies. It does not in any way comprehensively review the literature, and it says it's been associated with it. It doesn't say it's a causal association, which I thought was what we were going to be discussing here today.

DR. THOMPSON: I'll object as nonresponsive.

BY DR. THOMPSON:

Q. Because my question was, did these authors include a section on inflammation in this treatise?

A. They -- they included a section, but as I said, the section says there's a possible association between inflammation and an increased risk of ovarian cancer.

Q. And if the authors didn't

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think it was plausible that that association would be there, would they have included it?

A. I don't presume to be in the mind of the authors, and I don't know which of the authors was the major author of this section. So I can't answer that question to any degree of certainty.

Can I point out one other thing?

Q. I don't -- there's not a question on the table.

MS. SHARKO: No, he's finishing his answer.

THE WITNESS: I didn't finish.

DR. THOMPSON: No, he's not.

MS. O'DELL: He is not.

THE WITNESS: I am. I meant to point out that on Page 9, the same preface that you only read a small part of, at the bottom says, "An overarching conclusion is that ovarian cancer is not one disease.

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There are a number of different tumor types with characteristic histologic features, distinctive molecular signatures, and disease trajectories." Moreover --

MS. SHARKO: Slow.

THE WITNESS: "Moreover, these tumors are heterogeneous and they can arise from different tissues of the female reproductive tract."

So again, it just states what I've been saying all day, is that is that it's not meaningful to talk about ovarian cancer as a single entity. You have to break it down into each of the diseases.

DR. THOMPSON: And that was nonresponsive, because there was not a question about asking anything to do with that.

MS. SHARKO: Ignore that comment and wait for the next question.

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DR. THOMPSON: Object as nonresponsive.

BY DR. THOMPSON:

Q. Did you -- Dr. Neel, did you review the literature on pleurodesis?

A. Not extensively, no.

Q. Was it not relevant, the reaction in the tissue caused by talc injected into the pleural space to treat --

A. It's relevant for the study of mesothelioma.

Q. But it's not relevant for the study of the inflammatory effect of talc in the body?

A. It would be potentially relevant to the studies of peritoneal mesothelioma. But it's not necessarily relevant to ovarian cancer, no.

Q. So it's your testimony that injection of talcum powder into the pleural space has no meaning at all for what the reaction might be in a tissue like the ovary?

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A. It has relevance to what --
MR. LOCKE: Objection.
THE WITNESS: Can I answer the question?
MS. SHARKO: Yes.
THE WITNESS: So it's --
MS. SHARKO: You have to give everybody time to object.
THE WITNESS: It has relevance to what the response of the mesothelial cells of the pleural cavity are. It might be somewhat relevant to the response of the pleural -- sorry the peritoneal mesothelial cells. But there are direct experiments that address, some of which we've discussed before, the effects of talc injections into the relevant tissues of ovarian cancer. So why would I look at the irrelevant tissues?
BY DR. THOMPSON:
Q. Because, do we have any

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studies of injecting talcum powder into a woman's ovaries?
A. Into female -- into actual females?
Q. Yes.
A. Not that I'm aware of.
Q. Would it be ethical to inject a suspected carcinogen into a woman's ovaries?
A. Well, I --
MS. SHARKO: Object to the form of the question. Lacks foundation.
THE WITNESS: First of all, I categorically deny that it's a suspected carcinogen. It's characterized as a possible carcinogen. And that has been the standard -- that has been the conclusion, not just of IARC but also of the -- of the Taher, et al., report. So I assume that's what Health Canada will end up saying.

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And also sort of the sentiment behind the FDA, and it's also what's listed on the NCI website.
So I don't really think we should use the form -- the term "suggested carcinogen."
That being said, no, it would not be ethical to do that study.
BY DR. THOMPSON:
Q. And if you had read that Health Canada assessment, you would know that Health Canada actually does suggest a causal association?
MS. SHARKO: Object.
MR. LOCKE: Objection.
MS. SHARKO: Object to the form. Lacks foundation. Misstates the evidence.
THE WITNESS: I'm happy to look over the thing and discuss it with you, but I did read the Taher, et al., paper, and the

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Taher, et al., paper says the same -- basically the same thing as IARC: Possible.
BY DR. THOMPSON:
Q. And -- I'll leave it at that.
(Document marked for identification as Exhibit Neel-28.)
DR. THOMPSON: I'm going to mark this next article as Exhibit 28. And I just -- oh, I do have two.
MS. SHARKO: Thank you.
BY DR. THOMPSON:
Q. The correspondence that I'm interested in having you discuss with me is on the second page, "Talcum should not be used for pleurodesis with nonmalignant pleural effusions."
And I'll give you a chance to look at that if you'd like.
A. Yeah. So that is these people's opinion.

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Q. I agree. But at least these scientists felt strongly that talc should not be used for pleurodesis, correct?
A. Apparently, yes.
Q. And they stated that "talc is not a uniform substance and varies significantly in size and chemical composition with the latter depending on geologic origin. This sheet silicate can be contaminated with" -- "by asbestos, in association between carcinogenesis and exposure to asbestos included in talc, appears credible."
Do you have an opinion regarding that statement?
A. Yes. As I said, I think that -- that my opinion, based on everything that I've read is as I've stated it in my report, which is that there's no credible scientific evidence that talc causes cancer in the female genital tract.
So again, I don't really think that this -- there's -- this is

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basically just citing a couple of papers, and it's not in any way reputing anything that I've said, so...
And I don't even know where it's from. It's not cited on there. It wasn't -- I don't --
Q. It's not -- it's from the American Journal of Respiratory --
A. Yeah.
Q. -- and Critical Care Medicine, 2001.
A. Which, again, this was in 2001. There's a lot of science since 2001. I don't think it's relevant.
And furthermore it's not peer reviewed.
So I don't think it's relevant.
Q. And that's fine. But I am still entitled to ask you about it.
The authors at least were concerned about the presence of fibers, talc fibers in talcum powder used for pleurodesis, correct?

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A. That's what they said. But I have nothing to say about that. As I've said before.
Q. So you have no knowledge one way or the other whether fibers occur in talcum powder, and if so, whether there would be any health hazard as a result?
A. I can only comment on the studies that I read and commented on in my report, which have to do with the use of talc as cited in the methods and materials sections of the epidemiology studies and in the specific biological experiments that I cited.
I am not a mineralogist. I am not a geologist. I have no comment on the composition of talc today or prior to today, like in 2001, which was much long ago. So I don't even know that it's relevant to today.
Q. If you have a -- if you turn to Page 25 of your report. And you are discussing the Buz'Zard paper. And your opinion is that "this study and its

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interpretation by plaintiffs' experts is seriously flawed for multiple reasons."
The first reason that you give is, "The -- "the talc was obtained from a standard chemical reagent company, Sigma, and its quality, mineral and/or fibrous content and composition were not assessed."
A. Mm-hmm.
Q. And that was a criticism of the Buz'Zard paper, correct?
A. Yes. Correct.
Q. Do you know anything whatsoever about the quality, mineral and/or fibrous consent and composition of Johnson's Baby Powder?
A. No. But I know that -- that this study just used Sigma talc. So it's not directly relevant to Johnson & Johnson's products. That was my point in that statement.
Q. So studies done with talcum powder would not be relevant to Johnson's Baby Powder?

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A. Studies done with talcum powder would not be directly relevant to Johnson' Baby Powder, but studies done with Johnson & Johnson Baby Powder are relevant. So...

But in any event, this paper is not conclusive in any way that talc is pro-oncogenic.

Q. I -- I didn't ask that question. That's nonresponsive.

I was just asking why it mattered what the quality, mineral, and/or fibrous content and composition were in the paper using talcum powder by Buz'Zard.

MS. SHARKO: Is that -- wait. Is that a question? Or is that an explanation for why you asked the question?

BY DR. THOMPSON:

Q. Does it matter what the quality, mineral and/or fibrous content and composition of talcum powder is when you're assessing its potential molecular

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effects?

MS. SHARKO: Objection. Asked and answered.

THE WITNESS: It matters if you are trying to infer from studies done with Sigma that that definitely applies to Johnson & Johnson's products.

But in this case, because the evidence doesn't really say anything that's relevant, it doesn't matter.

BY DR. THOMPSON:

Q. You are very critical of Dr. Saed's work, correct?

A. Yes.

Q. Did you look at Dr. Saed's CV prior to this litigation?

A. No.

Q. Would that be something that you would be interested in, as to what Dr. Saed has published previously?

A. Oh, I looked at his publications subsequent to being engaged

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in this litigation.

You said prior to this litigation, didn't you?

Q. I did.

Did you look at Dr. Saed's CV after being retained to testify in this litigation?

A. I -- I didn't look. I don't recall if I looked at his complete -- I think I did look at his CV in the context of his report. But I also did a search on PubMed for the relevant papers.

Q. That was Exhibit 29. A partial --

(Document marked for identification as Exhibit Neel-29.)

MS. SHARKO: This begins with Page 29?

DR. THOMPSON: Yes.

MS. SHARKO: Is that correct?

DR. THOMPSON: Yes.

BY DR. THOMPSON:

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Q. And like -- like yourself, Dr. Saed's CV is quite extensive.

A. I wouldn't agree with that statement.

Q. Okay. It's 100, over 100 pages. So --

A. Quantity is not quality.

Q. I --

A. It's voluminous, but it's not published in highly cited journals, and I'm sure his H index is quite low.

Q. I didn't ask any question about where it was --

A. Yes, you did.

Q. -- where it was published or -- I just --

A. Well, that's quite relevant.

MS. SHARKO: All right. What's the next question?

DR. THOMPSON: Well, if you let me ask it, I will.

MS. SHARKO: Thank you.

BY DR. THOMPSON:

Q. Did you consider Dr. Saed's

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CV important or Dr. Saed's previous publications?
A. Once I read them, yes. I didn't read all of them. But I read several of them, as I've cited in my report. And I'm happy to go through each one of them and show why they're all flawed.
Q. I'm asking questions.
A. I'm answering your questions.
Q. That's not something I want to know. I don't believe I asked that particular question.
A. You asked me if I considered them relevant. And I told you that I did. And I read them, and that's why I assessed the studies as quite poor.
Q. Looking at his CV, would you agree that the focus of his lab has the study of oxidative stress and its biological effects?
MS. SHARKO: We don't have his CV in front of us.

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BY DR. THOMPSON:
Q. Looking at his published articles, would you agree that the focus of his lab has been the study of oxidative stress and its biological effects?
A. Some of the papers are on that. Some of them are on other things. So, you know, one area of focus appears to be on oxidative stress.
Q. What is oxidative stress?
A. So cells are exposed to -- we live in an oxidative environment, as we breathe oxygen. So we live in a highly oxidative environment. And proteins and other biomolecules, including DNA, undergo oxidative events.
And oxidative stress occurs when the pro-oxidative potential of cells exceeds the antioxidant capacity of cells. So that's oxidative stress.
Q. And is it fair to say that many scientists believe that oxidative stress plays a role in the etiology of

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epithelial ovarian cancer?
A. I don't know what "many scientists" mean. Some scientists do.
Q. Some scientists?
A. Yes.
Q. Do you disagree with those scientists?
A. I think that oxidative stress resulting from follicular fluid that's released from ovarian -- from ovulation events, there could be prooxidant species in there. But I certainly think that oxidative stress arising from general metabolism, which is primarily endogenous, mitochondrial oxygen -- the act of oxygen production can contribute to cancer generation.
Q. And you do not believe that oxidative stress from exogenous factors plays a role?
A. I don't think there's any compelling evidence that oxidative stress from exogenous agents plays a role in high grade serous ovarian cancer. That's

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what I think.
I think that it's conceivable, one of the possible mechanisms by which obesity promotes other forms of ovarian cancer, is through -- indirectly through oxidative stress, and there are several mechanisms for that.
Q. Is a role that oxidative stress plays in the pathogenesis of cancer and ovarian cancer something that would be considered controversial in the scientific community, would you say?
A. I think it's open to question, yes. I think -- yes.
Q. So there's some scientists that believe that it does play a role and others that believe -- who believe it does not, correct?
A. Yes, but talking about oxidative stress, you have to realize it's -- to be meaningful, you have to really narrow down what kind of sources of oxidative stress we are talking about.

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Q. And is it your opinion that oxidative stress from exogenous sources has no role in ovarian cancer?
A. I think I just answered that question.
Q. Okay. And do you believe that the scientists that would take another position are unreasonable?
A. I would have to see the details of the position. My objection to Dr. Saed's data, results or claims, are not that he's taking another position. It's that the evidence that he adduces to support his claims is either nonexistent or poor.
Q. But there are other scientists that have reported similar experiments and -- to Dr. Saed, and would you include them in the same category?
A. You'll have to tell me exactly what experiments you are referring to.
Q. Okay.
A. I don't think anybody has

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reported the myeloperoxidase in ovarian cancer cells because it doesn't appear to be. So there's many statements, as I pointed out in my report, that are contradicted by other data in the literature, including large scale studies done by international groups to look at ovarian cancer genetics.
Q. Can you direct me to a paper that explicitly states that myeloperoxidase does not occur in ovarian cancer cells?
A. If you look on the website that has all of the RNA sequencing data from the TCGA, you can see as I showed you in my report, that the level of myeloperoxidase RNAs below the level of action of tumor suppressing gene. So that is data.
If you would like to look through the tables of the TCGA report on which that's based, you can find the actual RNA sequence for myeloperoxidase.
DR. THOMPSON: Not -- object

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as nonresponsive.
BY DR. THOMPSON:
Q. I asked you for a paper.
A. Well, the paper -- the paper is the TCGA report. And if you look at the tables that come with the TCGA report which are now put on websites, and it is there. So yes, the TCGA 2012 report has RNA sequencing data on ovarian cancers, and if you look at that you will see that there's no significant expression of myeloperoxidase in ovarian cancer.
MS. SHARKO: Mr. Tisi, could you -- it's happened several times. Could you please not talk while the witness is talking.
MR. TISI: Actually I don't think -- I'd be curious if you heard it.
THE WITNESS: I actually did, but I tried to focus on DR. THOMPSON.
MR. TISI: I'm allowed to whisper to my colleague here. So

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if I interrupt you, I apologize. Would you do me a favor and let me know if --
MS. SHARKO: No. His job is -- his job is not to police you, Mr. Tisi.
MR. TISI: Well, your job is not to -- is not to school me, Susan. So I apologize if he heard me. And I leaned over and spoke to my colleague here. So please proceed.
DR. THOMPSON: We're going to look at some of Dr. Saed's other literature.
BY DR. THOMPSON:
Q. But I think there are several papers regarding myeloperoxidase. Those have all been peer-reviewed, the ones that are published, correct?
MS. SHARKO: I object to the form of the question.
BY DR. THOMPSON:
Q. Has Dr. Saed published

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papers regarding myeloperoxidase that have been peer-reviewed?
A. Yes, he has.
Q. And there are other authors on those papers as well, correct?
A. I think they are all from his lab.
Q. Is there any overlap between your research and phosphorylation cascades and signal transduction -- did I -- was that kind of close?
A. It's good.
Q. It worked. All right.
-- and Dr. Saed's research in oxidative stress?
A. I'm an expert in oxidation of protein-tyrosine phosphatases. We developed some of the novel technologies that were published in high quality journals on this subject. So I do have, you know, a significant familiarity with the issues attended to oxidative stress and oxidation-induced signaling.
So ox -- you know, reactive

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oxygen species are not just produced as a pathological event. They're actually part of normal growth factor and cytokine signaling. And I've worked on the fact that oxidative -- reactive oxygen species react with the highly activated neutrophilic cysteines, neutrophilic cysteines of protein-tyrosine phosphatases. And that's thought to be part of normal signaling. That's the only overlap.
Q. And I understand that you do not accept Dr. Saed's research as credible. But I'm trying to establish if your work and his work are mutually exclusive. Can both -- can -- are both plausible mechanisms?
A. My work -- my -- well, you haven't told me what mechanisms of Dr. Saed you are talking about.
Q. Well, let's just say oxidative stress and its role in the pathogenesis of ovarian cancer.
Is that mutually

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exclusive --
A. I don't --
Q. -- to what you're working on?
A. I know -- so my interest in oxidation has to do with normal physiological regulation and pathological regulation of protein tyrosine phosphatase activity.
I'm not sure which particular paper of Dr. Saed you are referring to, but I think many of the papers don't address what you say they are addressing. They may say that in the title, but they don't address that issue.
Q. You would agree that inflammation is part of a wider signaling network, wouldn't you?
A. That inflammation is part of a wider signaling network? No, I wouldn't agree with that statement. I don't see that that's--
Q. Is -- is --
A. -- it's a non sequitur in my

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opinion.
Q. Is oxidative stress a part of a wider signaling network in your opinion?
A. What do you mean by signaling network? I mean you're using, you know, jargon that's not very specific.
Q. Well, I probably read that somewhere.
Are there researchers -- I'm thinking particularly of Dr. Finkel? Do you know Dr. Finkel?
A. Torin Finkel? Yes, I know -- I don't know Torin Finkel personally, but I know his work.
Q. Does Dr. Finkel study signal transduction by reactive oxygen species?
A. Yes. His initial studies were the ones that provided the first evidence that normal react -- that reactive oxygen species were produced in response to normal growth factor signaling. I think the original paper

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was on PDGF simulation of smooth muscle cells and the evidence was that blocking oxidate with hydrogen peroxide generation by smooth muscle cells impeded PDGF receptor phosphorylation, which actually got me interested in the field since the most plausible mechanism by which that might occur would be inhibition of tyrosine phosphatase which we were working on -- we and others subsequently provided evidence to support that, as did Finkel.

Q. And that would be intrinsic ROS?

A. That would be --

Q. Or --

A. -- those would be -- that would be intrinsically produced ROS in response to growth factor signaling, not through mitochondria probably, but through a series of enzymes called NOXs or NADPH oxidases.

Q. Do you agree that an increase in ROS levels under certain

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conditions can cause DNA mutations?

A. Yes.

Q. And cancer is the result of genetic mutations, correct?

A. Yes.

Q. So under the right conditions, chronic inflammation could result in increasing ROS that could cause genetic mutations that could cause cancer, theoretically?

A. In certain context, yes.

Q. When I searched PubMed, I found the following, searching cancer and inflammation. 78,901, does that sound reasonable?

A. I have no idea, but I wouldn't --

Q. Ovarian cancer and inflammation, 1306. Oxidative stress and cancer, 23,845 publications. And oxidative stress and oxidative cancer, 427.

Dr. Saed doesn't have anywhere close to 427 publications

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regarding oxidative stress and ovarian cancer, correct?

MS. SHARKO: Wait. I -- I object to the preface and the speech and, therefore, the form of the question.

What is the question you're asking him?

BY DR. THOMPSON:

Q. Dr. Saed does not have 427 publications on oxidative stress and cancer, does he?

A. Well, I don't think he has 427 publications. So I guess that means he doesn't have 427 publications on oxidative stress and cancer.

Q. So someone else is publishing on oxidative stress and ovarian cancer, correct?

A. I don't know. I haven't done the specific search you did and I haven't looked at the papers but I'm happy to look at every single one of them.

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And I'm not saying that there is no possibility that oxidative stress plays a role in ovarian cancer. I'm saying Dr. Saed's papers are categorically and fundamentally flawed in almost every single instance.

Q. So are you saying that oxidative stress is a plausible mechanism for ovarian cancer?

A. I'm not taking a position one way or the other on that issue.

Q. Okay. So you do not have a -- you don't have a position on whether oxidative stress has a role in the pathogenesis of ovarian cancer. Your opinions today are specifically about Dr. Saed and his work?

MS. SHARKO: Object to the form of the question. Lacks foundation.

THE WITNESS: Can you ask both questions separately?

BY DR. THOMPSON:

Q. Yeah.

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A. I categorically say that none of Dr. Saed's work that was put forward as evidence in support of his contentions in his report is credible. That I say categorically.
Q. Okay.
A. In terms of whether oxidative stress plays a role in ovarian cancer, that question is too broad. If you narrow the question and ask me a more specific question, I might be able to give an opinion. But I think the issue is still under debate.
I think I made it very clear what the well-established pathogenesis of ovarian cancer is.
There's -- there is one SNP which I mentioned in my report, GPX-6, which interestingly is not a SNP that Dr. Saed cites, because I don't think he's familiar with the GWAS literature. That's the -- is associated.
I haven't had a chance to really look in detail as to what's known

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about that SNP. So that SNP does raise the possibility that oxidative stress in some form might be involved in the pathogenesis of some ovarian cancer. But I haven't really studied that in detail.
BY DR. THOMPSON:
Q. In -- in your -- you have not seen Dr. Saed's published paper, correct?
A. I saw the manuscript that was accepted for publication.
Q. But you don't know whether that manuscript is the same as what was actually published, correct?
A. Manuscripts accepted for the publication in my 30 years of experience as a faculty member are identical, except for minor positioning of figures.
Q. Okay. So you've never made edits on the final proof that's come back to you?
A. If it's accepted for publication, that's the final proof. The -- the version that's marked accepted

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for publication.
But if you'd like me to look at the final paper, I'm happy to do it. I doubt that there's anything different -- that's materially different from what I wrote in my report.
Q. But you didn't see any reason to look at it?
A. I didn't realize it was out yet.
Q. And your attorneys didn't provide the final published paper?
A. They mentioned to me yesterday that the --
MS. SHARKO: Well, wait, wait. What was discussed with the attorneys is privileged.
BY DR. THOMPSON:
Q. In your report you state that Dr. Saed's work is "technically and conceptually flawed and does not withstand critical scrutiny."
Did you write that statement?

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A. Yes. Every word.
Q. Is that a statement that you would put in a scholarly publication?
A. Technically and conceptually flawed, yes. But it would be assumed if I said that paper was -- in fact I've used that phrase many times in reviews. Well, sometimes I say technically flawed. Sometimes I say conceptually flawed. And when, as in the case of Dr. Saed's work, it's both, I say conceptually and technically flawed. That's exactly the wording that I would use in reviews.
That being said, I would not say that it wouldn't withstand scientific scrutiny because it would be assumed and understood by all scientists, including editors of journals, that when I say those statements that it doesn't withstand scientific scrutiny.
Q. That paper was peer-reviewed and accepted for publication and published, correct?
A. At a very low impact

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journal, yes.
Q. And did you review the peer reviewers' comments to Dr. Saed's paper?
A. I did. I think I cited some of the peer reviewers' comments.
Q. And we'll go over those in a minute.
And did you also write the sentence that questioned Dr. Saed's, quote, knowledge of basic cancer cell biology, genetics and biochemistry?
A. Yes, I did.
Q. What was your basis of questioning his knowledge of basic cancer cell biology, genetics and biochemistry?
A. Well, there were several reasons that I based that. So it had to do with the fact that, for example, he mischaracterized -- can we go to the actual page in my report? I think I actually provide the explanations there. Where is that exactly? Oh, okay here. I said it.
Q. Page 23.

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A. Yes. Dr. Saed -- okay. For example, he states that p53 is an oncogene, whereas it is a paradigmatic tumor suppressor gene.
He stated in his deposition that cells are grown at normal oxygen and glucose level.
Q. And they --
A. That's not true. I put the explanation.
Q. I know. We're going to go over those now.
A. I'm just answering your question.
Q. For example, he states that p53 is an oncogene. Are you aware of literature that describes p53 as an oncogene?
A. The lit -- p53 was originally described as an oncogene, and that was discovered subsequently that it was a tumor suppressor gene.
Q. There is literature still that refers to p53 as an oncogene, isn't

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there?
A. I don't know what literature -- p53 is the paradigmatic tumor suppressor gene along with RD and PTEN.
Q. And you state one of your basis for that claim is that Dr. Saed makes a truly extraordinary claim that talc treatment was associated with a genotype switch for SNPs in redox enzymes. If you read his paper, it would be clear that he was talking about a nucleotide -- nucleotide switch, correct?
A. That's what a genotype is.
MR. LOCKE: Objection.
BY DR. THOMPSON:
Q. Well, why is that an extraordinary claim?
A. Because it's impossible that that would happen in 72 hours in, in effect, a single nucleotide with 100 percent penetrance.
Q. So do you believe that Dr. Saed made up his results?

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A. I have no idea why Dr. Saed is making that claim. But it's simply impossible. It would be like finding a needle in a haystack and turning the needle into a hammer.
Q. Did any of the peer reviewers say that that claim was extraordinary?
A. I don't recall if they commented on it. I don't think they did, which illustrates the poor quality for peer review for that journal. There's no way that statement would have escaped the attention of any qualified peer reviewer.
And I believe that if you read Dr. Birrer's report, he points to the same issue. So any qualified molecular biologist would have noted that and pointed out how absurd the claim.
Q. Are you aware that the abstract that describes the mutations in the SNPs was reviewed by five to six reviewers and accepted for presentation at the SGO meeting?

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A. I have no idea who reviewed those. But they also have no knowledge of modern molecular biology if they accepted that claim. The fact that they don't understand what they're reviewing doesn't mean that they know what they're talking about. I'm telling you that there is absolutely no way that you can get that kind of a genotype.

In -- plus, I looked at the underlying data on which he based his claim, and the actual assay is flawed, and he didn't do the follow-up study that would have been necessary to prove that it was true.

MS. SHARKO: I would just ask that we be provided with a copy of these five to six peer reviewers. I think the court ordered you to do that, and I'll send you yet another letter on it. But that doesn't sound like something that was produced to us among the peer review that was.

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And so, we'd like a copy.

DR. THOMPSON: There is nothing in writing for abstracts accepted for meetings. But I can give you the policy of the meeting regarding how abstracts are peer reviewed.

MS. SHARKO: You just said there were five to six peer reviewers. Now you're saying there aren't?

DR. THOMPSON: I said they don't provide anything to the authors of abstracts regarding the results of their peer review.

THE WITNESS: Can I respond to that?

BY DR. THOMPSON:

Q. I haven't asked you a question.

MS. SHARKO: She's not going to ask you the question. Sorry.

BY DR. THOMPSON:

Q. Sure. I'll ask you the

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question.

Since, you know, Ms. Sharko challenged me, you've been program director for meetings, correct?

A. Yes.

Q. What was your policy or AACR policy for evaluating and determining what abstracts to accept for presentation at a meeting, at a national meeting?

A. First of all, my understanding was that this was not presented. It was presented as a poster. That's a big difference.

Q. Okay. Whatever the level, poster, presentation, published abstract. How did that process work when were you program director?

A. So we had people reviewing the abstracts. The reviews for abstracts, especially those for poster -- when you review abstracts at a meeting like this, there's literally thousands of abstracts. So you have to read through a lot of them very quickly. And the

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standard for accepting things for posters is quite low. It's nowhere near rigorous as what you would get for a high quality journal.

And Basically, people just want to see what's in the poster.

So the fact that it was passed -- that five people looked at it means that it was probably written in English, and not much more.

Q. And if SGO accepts 25 percent of abstracts submitted, that would probably be typical for a large national meeting?

A. No. Not for posters. I think when I was AACR program director, we accepted a lot more than that. And from other meetings, like Cold Spring Harbor meetings and facet (ph) meetings, we accept all the poster abstracts. It's the presented ones, the ones that are plenary sessions that are given as oral presentations, those are the ones that get a little bit more rigor.

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And even there, that's not really peer review. All we're seeing is what the person provided in the abstract. We're not seeing the data. And I'm telling you from looking at the data, it's an extraordinary claim.

Q. If SGO accepts 25 percent of abstracts for any type of presentation, whether it be poster or meeting, do you have any reason to doubt that figure?

MS. SHARKO: Well, I object to the form of the question. Lacks foundation. And I'm not sure I understand it.

THE WITNESS: So --

BY DR. THOMPSON:

Q. Did you understand the question?

A. Not really. What's the question?

DR. THOMPSON: Okay. You can leave off the speaking objections.

BY DR. THOMPSON:

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Q. The question is if SGO represents that they accept 25 percent of abstracts submitted at any level, do you have any reason to dispute that?

A. I have no knowledge one way or the other. I have no opinion on that subject.

Q. Okay. And if SGO sends abstracts to reviewers who identify themselves as experts in the field, do you have any reason to dispute that representation?

A. I don't know what field we're talking about.

Q. Molecular biology for example?

MS. SHARKO: Object to the form. Lacks foundation.

THE WITNESS: I have -- I have no knowledge of what SGO does. I don't go to SGO meetings.

BY DR. THOMPSON:

Q. Okay. Were you familiar with Dr. Saed's work prior to being retained?

A. No.

Q. Did Dr. Saed publish articles regarding cancer biology prior to 2017?

A. Yes. Apparently. I mean, from his CV and from my backwards search of his record.

Q. And did Dr. Saed publish articles about inflammation and ovarian cancer prior to 2017?

A. He published papers that claim to be about inflammation, yes. That's not the same thing.

Q. It's not the same --

A. We'd have to go through each paper.

Q. -- thing to claim and to be about inflammation?

A. Well, we'd have to go through the actual paper to see whether it's convincing.

For example, he says he publishes papers about oxidative stress,

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but the papers just look at levels of redox enzymes. And that alone does not say anything about the net oxidative tone in cells. You actually have to directly measure it.

And as I said in my report, he made these claims in his most recent paper, which was just apparently published, about oxidative stress. But he never measured it.

So you can't really say that there's a change in oxidative stress without measurement. You actually have to measure it.

He didn't measure 8-oxodG. He didn't measure BODIPY. And he didn't measure DCF florescence. Those are the standard measurements, among others, for looking at the net tone of reactive oxygen species inside cells, or other forms of reactive oxygen -- of -- of oxidative stress like lipid peroxidation or oxidative damage to DNA.

DR. THOMPSON: Object as

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nonresponsive.
BY DR. THOMPSON:
Q. Did he publish any articles about ovarian cancer and oxidative stress prior to 2017?
A. He did. And some of those are among the most that are off -- the most off point for this particular question.
Q. Are you finished?
A. Mm-hmm.
Q. Did you review any of Dr. Saed's pre-2017 articles?
A. Several of them, yes.
Q. And did you bring those with you today?
A. As I told you at the beginning of the deposition, I didn't bring anything with me today except my coat.
Q. Are they listed on your materials considered list?
A. Anything that I read of Dr. Saed's that I believe is relevant to

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this is referenced in thein the report.
Q. I did not see any articles of Dr. Saed's listed.
A. Then I didn't think they were relevant to the report.
Q. So you do not think any of Dr. Saed's prior publications were relevant to your opinion that Dr. Saed lacks knowledge of basic cancer cell biology, genetics and biochemistry?
A. No, I actually do think they were. I think -- I'm pretty sure I cited an earlier paper where he used -- where he did -- where -- for example, where he claimed that myeloperoxidase was in cells. He did that based on immuno staining, but he didn't have the proper controls for myeloperoxidase. So all he did was use an antibody. So that doesn't prove that it's there.
And -- and his claims for perturbation experiments involve the use of siRNAs. And he didn't have the proper controls that are required by all major

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journals, including use of multiple siRNAs and rescue controls.
So those -- those papers -- which I'm absolutely sure I did cite somewhere in this report, or at least I'm pretty sure. We can go through my entire report, but I'm pretty sure that I cited those papers and that specific information, that that gives me -- that makes me question the quality of his work. As I said in my report.
Q. But those papers were all peer reviewed and published in journals, correct?
A. As I said, none of his papers are published in high -- in high impact journals and the quality of review at lower quality journals often matches the quality of the journal.
Q. And you would consider Gynecologic Oncology a lower tiered journal?
A. I think it depends on what's being published in Gynecological

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Oncology. There are very fine papers published in Gynecological Oncology, but it depends on the particular topic.
And high quality molecular biology papers are rarely published in Gynecologic Oncology. Some of them are.
Q. How about Cancer?
A. Cancer is a very low quality -- a low impact journal.
Q. Would it be important for you to -- to look at the methodology that Dr. Saed had previously published in papers?
A. As I just said, I did look at the methodology. I always read papers very extensively. When I -- I mean, one of the things that I focus on most is the methods.
I always teach my students and postdocs that the methods are the most important thing you can read when evaluating a paper, because otherwise you can't know whether the data are valid.
So, yes, I did extensively

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look at his work.
Q. And you'll agree that Dr. Saed has considered the molecular changes in various histologic subtypes of ovarian cancer, right?
A. What do you mean considered?
Q. He's published use -- using -- looking at molecular changes in histologic subtypes?
A. I'm not sure which paper you are referring to, but I don't really think so.
In fact, one of the features of Dr. Saed's work is he does not appear to be aware of the recent evidence from Domcke, et al. and others that traditional so-called ovarian cancer cell lines are not representative of ovarian cancer -- at least traditional serous ovarian cancer cell lines are not really serous cancer lines.
So he uses standard ovarian cancer cell lines in some of his work subsequent to the publication of his work

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such as Domcke, et al. in Nature Communications in 2013 that are not real serous cancer lines and yet he makes the claim that they are -- or he assumes that they are.
So I did read those papers quite thoroughly. And I can tell you on multiple occasions his work is not scientifically conclusive and in some places categorically flawed.
Q. Has Dr. Saed to your knowledge ever been reprimanded or sanctioned for publishing false data?
A. I'm not accusing Dr. Saed of publishing false data. I'm accusing him of publishing bad science. I'm not accusing him of fraud. You only get reprimanded for fraud. Bad science, you just get a bad reputation.
Q. Does Dr. Saed have a bad reputation?
A. I don't know. But he does with me.
DR. THOMPSON: Good time for

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a break.
THE VIDEOGRAPHER: Remove your microphones, please. The time is 3:34 p.m. Off the record.
(Short break.)
THE VIDEOGRAPHER: We are back on the record. The time is 3:58 p.m.
BY DR. THOMPSON:
Q. Dr. Neel, are all the criticisms that you have of Dr. Saed contained in your report?
A. I believe so, yes.
Q. Are there --
A. Of the papers that are relevant to this case, yes.
Q. And are all the papers that you relied upon for your criticisms with Dr. Saed contained in the report?
A. I believe so, I'd have to -- can I look through the references? I'm pretty sure, but -- I guess his new paper, I don't have the final citation for that. So that would not be in the

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report.
Let's see. I'd have to look through the report. If you want me to take the time, I'm happy to do it.
Q. That's fine, because I need to know what literature you're relying on that forms the basis of your criticism of Dr. Saed.
A. So I did read the paper. On Page 17, the statement that he made on his report on Page 5, ovarian cancer patients manifest significant -- because some of those refer to earlier papers, which I just read. But I just cited his statement in the report and pointed out that it wasn't really relevant to his contention for the purpose of this litigation. So I would have to go back and see what those papers were.
Q. Where are you referring to?
A. Page 17.A at the bottom.
MS. SHARKO: We also served a supplemental materials considered list last night, DR.

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THOMPSON. I assume you have that.
DR. THOMPSON: Actually, I intended to mark that. I don't --
THE WITNESS: Yeah. The same thing refers -- I'm sorry. I didn't want -- the same thing refers to Point B on Page 17. That refers to an earlier paper by Dr. Saed, which I just cited based on his report. And his earlier studies of -- the statements that he made about the SNPs. So all of those earlier papers on SNPs that are not confirmed by the GWAS, genomewide association studies to be relevant to ovarian cancer, and are listed here.
So I -- so I based it on his report, and then I looked up the actual SNPs to see whether what he said had been confirmed by the GWAS studies.
BY DR. THOMPSON:
Q. Is it your testimony that

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you read every article that was included in Dr. Saed's report?
A. I definitely looked at every article that he authored that is in his report. I can't remember if I read every word. But I definitely looked at each of them to see if I thought they were directly relevant. And I probably read a large fraction of them.
Q. And why are those not included on your reference list?
A. Because I was referring to them from his report.
MS. SHARKO: I mean, just so there's no confusion. We gave Dr. Neel all the exhibits and all the documents that Dr. Saed produced that's on Page 40. We didn't take the time to list all that out.
MS. O'DELL: That's not what he was referring to in terms -- he wasn't referring to produced documents. I think he was referring to references. That's

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not what we're discussing. We're not discussing the produced documents from Dr. Saed.
THE WITNESS: We can go through his CV, and I'm happy to point out which papers I read.
DR. THOMPSON: Okay. Let's go ahead and do that.
THE WITNESS: So Number 1. Number 2 is not relevant.
Number 3 is not relevant.
BY DR. THOMPSON:
Q. But, you'll agree that those references are not included --
A. I didn't read them. Like I said --
Q. Let me finish my question.
MS. SHARKO: Wait. She's going to ask a new question.
BY DR. THOMPSON:
Q. That -- you'll agree that those references were not included on either your reference list or your materials considered list, correct?

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A. Well, because for the standpoint of my report, the fact that it's not germane to the issue here is what I was saying.
In other words, if you look on Page 17, he makes this statement that ovarian cancer patients manifest significantly decreased levels of antioxidants and higher level of oxidants.
I say regardless of whether the statement is true, it's a non sequitur. That's why I didn't list it as a reference. And I didn't consider those papers as part of this report and part of my opinion about, you know, the role of talc and ovarian cancer because this is not relevant.
So I looked at the paper.
Q. You're saying that statement in A comes from one of his other papers?
A. He references the other paper, but the issue is not relevant to this case, because it has to do with

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what's happened in already developed ovarian cancer. And the issue at hand is whether talc produces oxidative stress which causes ovarian cancer which occurs before fully blown ovarian cancer.

So that's why I pointed out it's not relevant.

Q. All right. So I'm entitled to know every paper that you relied upon for your opinions.

So if you need to go through Dr. Saed's CV and you can tell me which of these papers you read and relied upon, let's go ahead and do that.

MS. SHARKO: I object to the form of the question. There's a difference between reading and relied upon. Which do you want?

DR. THOMPSON: Okay. Well, let's go with materials considered, the title of his reference list.

BY DR. THOMPSON:

Q. So --

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DR. THOMPSON: And none of Saed's papers were on the materials considered list, either in the original or the supplemental. So --

MS. SHARKO: So I disagree with you on that because the exhibits to the depositions are, the depositions are, his report is, and his reported whatever it was attached to it.

So I take issue with that.

That being said, if you want to -- if you want to have Dr. Neel go through the CV, the part of the CV that's marked as Exhibit 29, and tell you which ones he's read, sure, you can do that.

MS. O'DELL: Exhibits to -- exhibits to Dr. Saed's deposition did not cover his previous publications. So to suggest otherwise, I think would be incorrect.

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DR. THOMPSON: That's -- Dr. Neel --

MS. SHARKO: I don't agree with that. But anyway, go ahead.

BY DR. THOMPSON:

Q. Were all the -- were all the publications that you reviewed of Dr. Saed's included within the exhibits from his deposition?

A. I'd have to look at his deposition to be sure.

Q. Well, it was in your file, right?

A. I know, but I don't have a photographic memory of everything that was in his deposition.

Q. And you didn't bring anything with you here today?

A. I didn't bring anything with me.

MS. SHARKO: Which is the agreement of counsel.

MS. O'DELL: No, it's not. We requested that materials that

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were considered be brought to the deposition.

There was no agreement that those would not be brought here today. You've asserted objections, and some of which we take issue with. But there's no agreement that the materials would not be brought.

MR. TISI: And I must tell you, we have brought -- we have brought every -- boxes of material to every one of the depositions.

So this is another example of you representing something that really didn't happen.

So if you would tell us where we agreed to that, I haven't seen it. Because we've got boxes and boxes and we gave it to you, for example.

MS. SHARKO: There was no -- Mr. Tisi, I'm not going to waste your side's time having an

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argument.
MR. TISI: Good, because you can't because there was no such agreement.
You make these kinds of assertions repeatedly and they are just not true. So you --
MS. SHARKO: You are totally wrong, Mr. Tisi.
MR. TISI: So tell me where it is we agreed that he could not bring materials relied on, when we asked them in the notice of deposition.
MS. SHARKO: We served objections to the deposition notice, which you have.
MR. TISI: That's not an agreement.
MS. SHARKO: There was no agreement to bring all the stuff that everybody reviewed. If there's something specific you want, let's figure it out and get

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it.
MR. TISI: But he's -- but you said there was an agreement of counsel not to bring things, which is totally different than you objecting to something on the notice of deposition.
MS. SHARKO: I disagree with you, Mr. Tisi.
MR. TISI: Okay. Well, I think the record will --
MS. SHARKO: You constantly make misrepresentations, Mr. Tisi, but that's --
MR. TISI: That's a deflection. That's a deflection.
You made an assertion, Susan, that there was an agreement of counsel not to bring information to the deposition that the witness relied on. That's not true. So --
MS. SHARKO: I disagree -- I disagree with you. But let's move

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on.
MR. TISI: Okay. Well, tell me where it is. Tell me where we agreed not to bring information relied on.
MS. SHARKO: No.
MR. TISI: Okay.
MS. O'DELL: I think, tell us where and tell us who you believe made that agreement, because I can tell you the only other person that would have the authority to make that agreement is Michelle. She is not here. It would be Chris or myself.
This is not true. So let's move on. But if you're going to take the position that you're not going to bring materials for experts in these depositions, then we need to take it up with Judge Pisano, because that's clearly not in compliance with the rules.
MS. SHARKO: So -- so if

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there's -- there are things that you think should be brought to the depositions, let's talk about that afterwards.
MR. TISI: Everything that was in the notice of deposition. Every -- because I -- you know, we -- we have depositions coming up and unless there's some basis like privilege or something like that, we expect you to bring them to the deposition.
MS. SHARKO: All right. I'm not going to have this discussion --
MR. TISI: Of course you don't want to.
MS. SHARKO: -- now on the record.
MR. TISI: Of course you don't want to. Because -- because we did it. We did it and you didn't.
MS. SHARKO: Mr. Tisi, let's

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move on.
I'm happy to --
MR. TISI: Okay.
MS. SHARKO: Leigh, I'm happy to talk to you afterwards or tomorrow. You'll probably be in Atlantic City, right?
MS. O'DELL: We'll see.
MS. SHARKO: We'll see? Okay.
The judge changed the time, did you see that?
MS. O'DELL: I did see that.
BY DR. THOMPSON:
Q. Okay.
A. I looked through -- so I want to clarify what I meant.
So I read several of these papers to see if they were relevant and I -- if I thought they were irrelevant, I said they were irrelevant.
But if you want to know which ones, it's what he cited in his paper. But I -- I mean --

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Q. Okay. Let's --
A. -- there are very few additional papers that are even cited by him in his paper, in his report, that are relevant.
Q. Okay. First off, let me just ask you, are any of the papers listed on Dr. Saed's CV relevant in your mind?
A. The most relevant one is the -- is the current one, which is the one that was in press. And that's the one that I criticized the most specifically.
Many of the other ones are cited by Dr. Saed as relevant, but they aren't relevant in my opinion, as I state in my report.
So, for example --
Q. So -- okay. So no -- none of Dr. Saed's previous publications that are relevant in your opinion with the exception of the one just published; is that correct?

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A. Yes, but several -- several of them have, you know, statements which are not true, like the thing about the SNPs.
Q. Was the methodology that was used in the previous publications and peer reviewed relevant at all?
MS. SHARKO: Object to the form of the question.
THE WITNESS: Yeah, I don't know which particular methodology or paper you're referring to.
BY DR. THOMPSON:
Q. Well, I'm saying if Dr. Saed used the same or similar methods publishing this paper that he did in previous papers, is that relevant?
A. He didn't use the same method. The -- the earlier work was just based on small SNP analysis. This was based on use of panels of SNPs, arrays of SNPs. It's a -- it's a new -- relatively -- it's a more modern method that's available in the earlier papers.

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Q. But you'll agree with me that there -- there's a lot of data in Dr. Saed's paper that goes beyond just the SNP analysis, correct?
A. The SNP analysis is the only analysis which addresses the extraordinary claim of a genotype switch in response to talc treatment of cells. So that is the only data.
What he should have done was carry out Sanger sequencing, since he's claiming that there is a wholesale change in a genetic content of a specific polynucleotide -- of a specific SNP within 72 hours of talc treatment which would be utterly unprecedented as far as I know in molecular biology.
Q. Okay. Let's -- let's go ahead and have you identify what articles from Dr. Saed's CV that you considered.
A. Oh. For example, on Page 30 he said -- he had a paper, "Specific point mutations and key redox enzymes are associated with chemoresistance and

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epithelial ovarian cancer." I looked at that paper and immediately concluded that it was not relevant to this litigation or the question of my report because it has to do with fully blown ovarian cancer.

So I looked at the paper, but it's not relevant for this, so I didn't cite it in my reference.

Q. So which --

A. Similarly --

Q. -- which paper was that?

A. Reference 9.

Q. Give me a number --

A. Page 30.

Q. Okay. So that one you looked at and determined it was not relevant?

A. Correct.

Q. Let's just go through, and --

A. Similarly --

Q. -- tell me if there are others --

A. Reference 15 addresses a

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similar subject. Not relevant.

Q. Oh, okay.

A. Reference -- I'm just referring to --

Q. Do you have the exhibit there?

A. Yes.

Q. Would you go ahead and mark on the exhibit?

A. I thought I'm not allowed to mark the exhibits.

Q. You are if we ask you to.

A. Okay. Sure.

Q. Go ahead and -- just so we'll have the record. Go ahead and mark which ones that you considered.

MS. SHARKO: Considered meaning read?

DR. THOMPSON: I'm just using the language that's in the statute, materials considered, and what's on his reliance list -- on his materials considered list.

THE WITNESS: I don't know

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how to answer that, because there's obviously a legal issue here that I don't understand.

But, I mean, if I read something and it's not relevant to my opinions, does that mean that I considered it? Okay. Well, in that case...

MS. SHARKO: That wouldn't be my interpretation, but if that's your question. That's fine.

BY DR. THOMPSON:

Q. Well, it's fine to go ahead and tell us whether or not you -- go ahead and circle the ones that you read and I may ask you questions.

A. Sure. Reference 26, I read. It was relevant to something I'm interested in, but it wasn't at all germane. So I don't know how you would count that one.

MS. SHARKO: By the way we have the references in the

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doctor's report in the other room if you want them if you can't find a paper.

DR. THOMPSON: Okay. Thanks.

THE WITNESS: Again, 45 would fall under the same category. That's it. Oh, wait the review articles.

BY DR. THOMPSON:

Q. Dr. Neel, if you're finished.

A. No, I didn't look at the reviews. You can have your pen back too. I am a pen stealer. I admit to that.

Q. So Dr. Neel, let me just ask you about the articles that are circled on Dr. Saed's CV, Exhibit 29, and have you tell me whether these were papers that you relied upon for your opinions or decided were not relevant or any comments that you want to make.

A. Sure.

MS. SHARKO: Except now he

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doesn't have a copy of it in front of him.
DR. THOMPSON: That's true.
THE WITNESS: You can keep handing it back and forth to me.
DR. THOMPSON: No, let me -- or maybe share Ms. Sharko's copy.
MS. SHARKO: Okay. So my copy won't have circles on it.
DR. THOMPSON: Right. I'll tell you a number and you can tell me.
That's probably even better.
BY DR. THOMPSON:
Q. On that exhibit, let's go through the ones that are circled. If you could just mark relevant or irrelevant. "I" for irrelevant -- "I" for irrelevant and "R" for relevant. How is that?
MS. SHARKO: Those are the only two choices?
BY DR. THOMPSON:
Q. If you have a different

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choice, we can have a write-in candidate.
A. How about not directly relevant, although it was cited by him as relevant.
Ditto, not directly relevant, although he asserted it was.
As I said, as I recall the only one that's directly relevant is the more recent one. And all the other ones are claimed as being relevant but they're off point, in my opinion. I'm going to write the same thing on all the other ones. There aren't that many, because most of these papers are not directly relevant.
So for example, Reference 52 is not -- this is the one where he, I believe, shows -- I don't have the paper in front of me. We'd have to look at it. But I believe that's the paper where he claims that myeloperoxidase expressed in ovarian cancer cells.
So that's not relevant to the topic at hand, but it is relevant to

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my opinion that, you know, he's misinterpreting the data. So I don't know how to -- how to write that.
Q. And that paper was published in Gynecologic Oncology, right?
A. Yes.
Q. And peer-reviewed, right?
A. Yes, as I said before, the very fact that -- if it's not peer-reviewed, it's completely unreliable until it's peer-reviewed. But the fact that it's been peer-reviewed doesn't make it right.
Q. Do you know the --
MS. SHARKO: Well, wait. He's still going through the -- through the last task.
THE WITNESS: I think that's -- that's -- I think that's all of them. Yeah. Okay. I marked them all.
BY DR. THOMPSON:
Q. Okay. Thank you. Do you recognize any of the other authors on

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these paper as you look through it? By memory, name the authors that you recognize.
A. I don't remember -- I mean, I don't --
Q. Could you just glance through and see if you --
A. Sure.
Q. -- recognize any of the other authors.
A. Sure.
MS. SHARKO: On the ones that he marked, right?
THE WITNESS: I recognize Fletcher, because I know that she's in the lab. I recognize her name from the deposition. But I don't know any of the other authors. Fletcher again.
BY DR. THOMPSON:
Q. So is it fair to say, Dr. Neel, that you don't know the reputations of any of Dr. Saed's co-authors on these papers?

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A. So far, that's fair to say, yes. But I believe that the overwhelming majority of them are people who are working in his lab.
Q. Do you know that or are you guessing?
A. No, I know that from the papers that I remember reading, I think most of them, it was from one lab. But I could be -- we can go through each individual paper if you want. But that reputation -- reputation is not relevant to me.
What's relevant to me is my reading of the papers and assessment of their scientific quality. And that's what I did, and that's the basis for my conclusions on Page 23, Point K.
Q. Let's switch gears a little bit, Dr. Neel.
You looked at other papers directly related to molecular effects of talc or talcum powder as well, correct?
A. Most of which, we've already

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discussed. But yes, everything that's in my report is what I looked at.
Q. Let's talk about that Buz'Zard paper that you read and included in your report on Page 25.
A. Yes. Buz'Zard and Lau.
Q. I could have swore I put those stickers right where I could find. There they are.
DR. THOMPSON: This will be Exhibit 30, the paper by Buz'Zard.
(Document marked for identification as Exhibit Neel-30.)
MS. SHARKO: Do we have a 29?
THE WITNESS: Maybe that was the CV.
MS. SHARKO: Oh yeah. CV was 29. I'm sorry.
BY DR. THOMPSON:
Q. Do you recall reading this paper?
A. Absolutely.

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Q. And you had actually quite a few criticisms of this paper as well?
A. Yes.
Q. Correct?
A. Yes. Starting with the fact that it's published in a journal that's not really relevant to ovarian cancer or cancer, Phytotherapy Research. I don't think I've ever seen a paper on ovarian cancer in Phytotherapy Research.
Q. But you'll agree that the paper at least deals with ovarian cells cultures and molecular effects, right?
A. A small part of the paper, yeah. Yes.
Q. This paper was peer-reviewed, right?
A. By somebody who reviews for Phytotherapy Research, which is highly unlikely to be anyone who is a credible ovarian cancer researcher.
Q. And in the abstract of this paper, the authors state, "Talc increased proliferation, induced neoplastic

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transformation, and increased ROS generation time dependently in the ovarian cells and dose dependently in the PNM."
Did I read that correctly?
A. Yes, you read the statement correctly.
Q. And is it your opinion that those statements do not actually reflect what the experiments demonstrated?
A. Yes. It's my -- it's my contention that this paper is highly flawed in multiple ways, starting with -- do you want me to tell you all the ways that it's flawed?
Q. Sure.
A. Starting with the fact that we have no idea what a -- if there -- if talc does get from the perineum into the fallopian tube or the ovarian surface epithelial region, we have no idea of what a relevant dose is. So picking these doses has no biological relevance.
In fact, I don't think you

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can actually study the question unless you have an idea of the dose of the agent that gets to the relevant tissue. So the first problem is the design of the experiments is intrinsically flawed.

The second point --

Q. Can we go one at a time --

A. Sure.

Q. -- just because I have question --

A. Sure. Yeah, you asked me to --

Q. It will be easier -- yeah.

A. So that's my first problem.

Q. Aren't in vitro studies frequently done for mechanistic purposes and not necessarily to determine a relevant dose?

A. It's well known that the only relevant studies that are done in vitro are done with a relevant dose of the agent that you're testing.

So I can only comment on well-designed and well-performed

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experiments, not poorly designed and poorly performed experiments.

Q. How would you know a relevant dose if you wanted to look at talcum powder in vitro and how it would relate to women who are using talcum powder regularly on their perineum?

A. That's exactly the point.

Q. So are the -- would all molecular studies be worthless?

A. Until you can define a reasonable dose, it doesn't -- you can't do an experiment that's relevant to the question at hand.

If you just go dumping talc at various levels onto cells, it may have absolutely no -- it probably has absolutely no relevance to what happens when you apply talc to the perineum of a woman, and if and whether any degree of talc gets to -- to the relevant tissue.

Q. So in your opinion, with our current knowledge, it would be impossible to do a molecular study with talcum

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powder that would be relevant?

A. I think it would be impossible to do a compelling study until you first answered the question of whether perineum -- talc applied to the perineum of a woman gets to the ovary and at what dose --

Q. How do you --

A. The fallopian tube.

Q. How do you ascertain that information?

A. It's not my -- I would have to sit down and think it through. That's not my purpose here today.

My purpose is not to do the experiments for them. My purpose is to evaluate the published data.

And my opinion is that the study starts out being flawed by not knowing anything about a relevant dose. It's their obligation to figure out a relevant dose, not mine. It's my obligation to read their paper and decide whether it's scientifically credible.

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But that's the -- that's only the first of many weaknesses of this study.

Q. We'll get -- we'll get to some -- let me finish my question here and then we'll get to the others.

Assuming that you did not have a conflict of interest policy at your institution, could you design a study, a molecular study that you think could be relevant to studying the issue that we are talking about today?

A. I don't know. I haven't really given it any thought. I haven't given it significant thought. Maybe. I'd have to think about it for a while.

Q. Okay. Let's go on with your -- your criticisms.

Are these the same that are outlined in your report?

A. Yes.

Q. Or are there additional ones?

A. Yes, those are exactly the criticisms. But I'm happy to go through

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each of them if you want.
Q. Let's go ahead and go through them.
A. Okay. Well, granular -- most of the study, a large fraction of the study concerns granulosis cells which are not relevant to epithelial ovarian cancer of any type.
Q. So is it your opinion that seeing biological effects on cells from anything other than tubal epithelium are irrelevant?
A. Well, even if they had, you know, primary ovarian surface epithelium, that might be relevant because I think there is some evidence that some ovarian cancer come from the OSE, ovarian surface epithelial, OSE.
But these cells are already transformed with SV40 large T antigen. And SV40 large T antigen inactivates the two major oncogenic pathways. It activates all members of the RV family and it inactivates p53. So these cells

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are already transformed.
So if you're trying to investigate the effects of a potential initiating event, then this study is irrelevant.
Plus it's well known that SV40 large T transformed cells are genetically unstable and any -- and different lines are different. So it's really not generally accepted that you use a study where you transform cells with SV40 large T and -- and use that to infer something about normal biology.
So I think that's a serious weakness of this study.
Q. Okay. Next?
A. The third point is that they don't show any tumor genicity studies. It would have been very easy for them to take these cells, treat them with talc and then inject them into immunoincompetent mice and at least see if there's any evidence of transformation.

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It's well known that soft agar transformation in human cells is not predictive of -- of tumorigenicity which is the issue at hand.
And the -- if you look carefully at the data, the -- the purported pro-oncogenic effects on cellular proliferation and on ROS occur at two different doses of talc.
So notwithstanding my criticism about the dose in the first place, it's not known which of these doses would be relevant.
So I think that pretty much covers it.
Oh yeah, the polymorphonuclear leukocyte experiments are not relevant because, as we discussed earlier today, there is no evidence for white -- for poly -- or PMN infiltration into the premalignant lesions of -- of human fallopian lesions like STICs or stills or p53 signatures.
So I don't really think

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there's much in this paper to support the case that talc is pro-oncogenic.
Q. And --
A. It's a very poor quality journal and it's -- I don't think these authors have ever published on this again as far as I can tell.
Q. Is it -- is it fair to say your criticisms of the Buz'Zard paper are similar to those of Dr. Saed's paper?
A. No. They're -- they are different.
Q. In terms of being flawed?
A. Well, I mean I would say that it's like Anna Karenina. They are flawed in different ways.
Q. Fair enough. Let's -- and -- and the -- the results and mechanism that the authors are proposing in this paper are -- are not even plausible in your mind?
A. Plausibility requires good experiments. These are bad experiments. So based on this set of data, there is

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nothing that can be educed from this work as to biological plausibility in my opinion.
Q. Let's -- let's go next to the Shukla paper. Do you remember --
A. Shukla?
Q. -- seeing that paper?
A. I remember the paper -- I remember the name. It's an unusual name so I remember. But I don't recall the -- I'd have to see the paper to actually comment on it.
Q. I'll hand that to you now.
(Document marked for identification as Exhibit Neel-31.)
BY DR. THOMPSON:
Q. Did you review this paper, Dr. Neel?
A. Yes.
Q. And I believe you discussed this paper in your report as well, correct?
A. I do. Can you tell me the

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page though?
Q. Yes.
A. So I can make sure.
Q. It's Page 21. Beginning on Page 21.
In this paper, the authors reported --
A. Hold on. I don't see it on 21. Can you tell me where it is on 21?
Q. Page 21 of your paper in the last paragraph.
A. Oh, sure, yeah, yeah. Sorry. It's in the middle.
Q. And in this paper the authors report all -- alterations in gene expression following exposure to asbestos as well as talc in mesothelial and ovarian surface cells, correct?
A. Yes.
Q. Do you have criticisms of this paper?
A. Hold on. Let me go through it again. It's been a while since I saw it. And the criticisms that I have are

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in the report. But let me just look at it again. Oh, yeah. So again, this is an SV40 Tag-immortalized anchorage-dependent human ovarian epithelial line, so it's --
MS. SHARKO: You've got to go much slower. Sorry.
THE WITNESS: Oh, I'm sorry. On Page -- on Page 115 in the left-hand column, midway through under the methods, which I write extensively, it's an -- the authors use for ovarian surface epithelial cells an SV40 Tag-immortalized, anchorage-dependent human ovarian epithelial cell line.
So this suffers from the same issues that I just mentioned for the Buz'Zard paper in that it's using a cell line that already has -- should I continue?
BY DR. THOMPSON:
Q. Yes, I'm sorry.

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MS. SHARKO: Okay.
THE WITNESS: This paper uses an SV40 Tag-immortalized anchorage-dependent human ovarian epithelial cell line which, therefore, suffers from the same issues that I raised earlier with the paper by Buz'Zard and Lau in that this -- these cell lines are -- already suffered -- already have had introduced a minimum of two of the transforming events that occur in ovarian cancer.
So the cell line is not necessarily germane to the initiating events of ovarian cancer. That's the first thing.
The second thing is that the paper primarily concerns, you know, asbestos effects on mesothelial cells, not so much the effects of talc on ovarian epithelial cells.
And if you look at the

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changes. In fact, if you go to Page 2009. In contrast to LP9/TERT and NYU474 mesothelial cells, that's referring to the pleural mesothelial cells.

IOSE cells showed no significant gene upregulation or downregulation in response to lower concentrations of asbestos and no significant mRNA changes were observed with non-fibrous talc, fine titanium dioxide, or glass beads at either time point.

So the relevant cell type shows no changes in gene expression, and the irrelevant cell type shows minimal changes in gene expression in response to talc.

So again, I don't really think that Dr. Saed's quote is relevant. So if you read my report on Page 21, I refer to Shukla, et al., in the context of

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Dr. Saed's citation, not -- not because I think this is necessarily germane.

I am responding to Dr. Saed's claim it's germane and showing that it isn't germane in my opinion.

BY DR. THOMPSON:

Q. So your opinion --

MS. SHARKO: He was reading from 118, not 2009.

THE WITNESS: Oh, did I --

DR. THOMPSON: I found it.

MS. SHARKO: You did.

THE WITNESS: I'm sorry.

MS. SHARKO: No problem.

THE WITNESS: Sorry. Thank you.

BY DR. THOMPSON:

Q. And so this paper, in your opinion, is not relevant for the issue that we're discussing today?

A. Well, if anything, it says there is almost no effect of talc on

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these cells --

Q. Well, my question is --

A. -- in terms of gene expression.

Q. -- as to the relevance.

A. Well, it's not -- it's not relevant, and it's not -- it doesn't support the claim that ovarian cancer is caused by talc. So in that way it's not relevant.

Q. Would you consider this paper reliable?

A. Reliable? I mean, they measured -- insofar -- so it's reliable in the sense that they've used established techniques, and I'm sure that the gene expression data is correct. Reliable insofar as one can draw conclusions about asbestos or talc, I have no comment about what a relevant dose would be of asbestos, because I haven't researched that issue. But I do have a comment, the same comment that I raised earlier about a difficulty in

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knowing what would be a relevant dose of talc.

But in this case, the doses they chose had no significant effects. So it's not germane unless the -- unless the point is to say that talc doesn't induce gene expression changes in the human ovarian cells.

Q. If -- and is it your understanding that this paper or these authors used non fibrous talc in the studies?

A. I don't recall. I have to look at what they used.

Q. It's in the abstract or the methods.

A. Well, I would prefer to use the methods.

Q. Sure.

A. I have to look at it. I have to go to the results because they characterize the fibers. I'm not really an expert in fibers. But I believe Dr. Mossman is an expert for the

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defendant. So I think that she would probably be better at explaining this than I.

Yes, they claim that it's non-fibrous talc. But again, I'm not an expert in mineralogy or geology. So I can't comment on the quality of their evaluation. But I will say that it's non-fibrous talc, according to the paper.

Q. And if Baby Powder were shown to contain fibrous talc or asbestos, how would that change your opinions regarding the paper?

A. Well, it would just make this paper even more irrelevant because they didn't use Johnson & Johnson's products.

Q. Do you know Dr. Mossman?

A. I don't know her. I know of her reputation, but I don't know her.

Q. And you haven't spoken to her --

A. No.

Q. -- regarding this case?

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A. I've never met her or spoken to her.

Q. I believe you had two papers by Dr. Akhtar on your materials considered list. Does that sound familiar?

A. Yeah. I don't know if that's the -- I didn't know how to pronounce that name.

Q. I don't either so you're -- does anyone?

A. It sounds like it's right. A-H-K or something?

MS. SHARKO: That's Exhibit 32.

(Document marked for identification as Exhibit Neel-32.)

DR. THOMPSON: 32 is the Akhtar paper.

BY DR. THOMPSON:

Q. "The Primary Role of Iron Mediated Lipid Peroxidation."

Does this paper look

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familiar, Dr. Neel?

A. Yes.

Q. And did you read this paper?

A. A while ago, yes.

Q. Do you --

A. I don't remember if I actually -- was there a place in my report that you want to discuss here?

Q. I don't believe that -- oh, actually, I think you did discuss this in here. Let me find it. Yes, it's on Page 24.

A. 24. I thought I remember typing that. Yes.

Q. And do you have criticisms regarding this paper?

A. Yes. As outlined in my report on Page 24.

Q. And what are those?

A. These authors measured the effects of talc on A549 cells, which are lung cancer cells, and found ROS production, oxidation of cellular lipids, and DNA damage.

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So, again, these are already established lung cancer cells. So I don't see the relevance to the question of initiation of ovarian cancer. That's first thing.

The second thing is that -- the same issues having to do with dose are germane here. And I guess I should see -- I don't remember which form of talc they used. Yeah, so commercial talc. So again, those are my main criticisms.

They use dose -- again, as I said, it's not clear as the dosage used here or seen here relate to the small number of particles that are presumably found in the reproductive tract, if they're there at all.

Q. Are you aware that Dr. Saed used the same dosage as Dr. Akhtar reported in his paper?

A. I'd have to look to be sure. But perhaps. Dr. Saed's papers are seriously flawed, as we've already

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discussed.
Q. Yeah, I understand your opinion as to that. The author's first sentence in the abstract is, "Talc particles, the basic ingredient in different kinds of talc-based cosmetic and pharmaceutical products, pose a health risk to pulmonary and ovarian systems due to domestic and occupational exposures."
Do you disagree with that statement --
A. Yes.
Q. -- that Dr. Akhtar makes?
A. Yes.
Q. Do you think that Akhtar is -- Dr. Akhtar is not credible?
A. I have no knowledge as to Dr. Akhtar. I have never met him. Don't know anything about him. Don't know his reputation and can't comment on it.
Q. This paper was peer reviewed and published?
A. Yes. And I also can't

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comment, since I'm not a toxicologist, on the quality of this journal. But I think it's probably not a high impact journal or a high quality journal.
Q. Do you know if nanoparticles would apply to Johnson's Baby Powder?
A. As I said, I am not -- not a mineralogist, I'm not a toxicologist. I can't comment on any of that.
Q. So you --
A. I don't have any professional opinion on that.
Q. So you really have no idea as to the particle size of Johnson's Baby Powder?
A. I have no idea as to the particle size.
Q. And the authors a little further down in the abstract state, "Both varieties of talc nanoparticles differentially induce lipid peroxidation which was correlated with the pattern of lactate dehydrogenase leakage, reactive oxygen species generation, and

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glutathione depletion."
Those were at least some of the same things that Dr. Saed studied, correct?
A. No, actually -- no, that's not correct. Actually, the major weakness of Dr. Saed's paper is he did not measure. As I said earlier, if you are going to claim a difference in redox balance, you have to measure redox balance by measuring ROS generation in the form DCF fluorescence or other types of ROS sensor assays. Lipid peroxidation by BODIPY staining or other methods like -- oxidative damage to DNA by ADG staining, none of which Dr. Saed did, as I said earlier.
Q. Did you -- do you have any other criticisms of this paper?
A. My -- my major point about this paper as I've said already, is that it concerns already developed lung cancer cells and it is well known in the scientific literature that there is

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differences between the effects of ROS in cancer cells that are already established, and in particular, in cancer cell lines that have been passive for many years, and in particular, in different types of cancer cells than are present in normal cells.
So the paper is -- is not germane in my opinion to the question of whether talc causes ROS changes and reactive oxygen induced damage in primary fallopian tube epithelium or primary ovarian surface epithelium.
That is the relevant question. Notwithstanding all the issues about dose that we've talked about.
Q. You'll agree though that the authors of this paper at least thought that their experiment was relevant for ovarian cancer, right?
A. I have no idea --
MR. LOCKE: Objection.
BY DR. THOMPSON:
Q. Well, they stated it that,

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in the first sentence, that --
A. They -- they said that --
Q. -- it poses a risk to pulmonary and ovarian systems.
A. Well, that's their opinion. That doesn't say whether they thought they were -- whether they thought it was relevant. All they can say is that it -- that assuming that everything in this paper is correct, in terms of the measurements and all that, which I have no reason to question, they can't say anything about dose, and they can't say anything about the relevant cells.
So, cells are not cells. It's not like, you know, parts is parts in Perdue chicken.
Q. What's you -- what's your basis for opinion that the -- the cells used in this experiment are not relevant for ovarian surface epithelium?
A. Well, as I've already said, they are lung cancer cells. They -- they are a mutation. So A-549 cells have KRAS

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mutations. I believe it's -- it's either G12B or G12D, and that is completely irrelevant to the overwhelming majority of serous cancers, much less serous ovarian cancer transformation.
So it's a lung epithelial cell. It's a transformed lung epithelial cell. It's bearing a mutation that is not found characteristically in serous cancer, and it's bearing a mutation that when it's found in serous cancer is not part of the initiating events in serous cancer.
So irrelevant cell type, irrelevant mutations, irrelevant stage of carcinogenesis, and questionable dose. I -- I don't really see anything that could possibly be relevant to the question at hand when every other issue is irrelevant.
Q. Is there any publication on your reference list or your materials considered list that would provide insight into that opinion that you're

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providing, that lung cancer cells are irrelevant to the ovary in terms of study of this issue?
MS. SHARKO: Object to the form of the question.
THE WITNESS: Can you repeat the question? I'm not sure, there was a lot of --
BY DR. THOMPSON:
Q. Yeah, it was a bad -- it was a bad -- it was a bad question.
A. Sorry.
Q. Can you point me to an article that's on your reference list or materials considered list that addresses the basis for your opinion that lung cancer cells are irrelevant to ovarian cancer?
A. I -- I didn't say lung cancer cells were irrelevant to ovarian cancer, although I would agree largely with that statement.
What I said was lung cancer cells -- the use of lung cancer cells to

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determine the effects of agents on nontransformed ovarian epithelial cells or fallopian tube epithelial cells is irrelevant.
And I think that should be self-evident to any practicing scientist in the cancer biology field. I don't think you would find any scientist, credible cancer biologist, who would think that using A-549 cells to model any aspect of ovarian cancer pathogenesis is relevant.
Q. Well --
A. And I would reject categorically from the six journals that I'm an editor of any paper that presumed to do the same, which is probably why a journal -- a paper like this is published in a low impact, low quality journal, and not in any of the six journals that I'm an editorial board member of or that I've been an editor of previously.
Q. I understand that. But we have to be able to explain your opinions

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to nonscientists. And it would be -- will be helpful to be able to refer to an article or something that can address the irrelevance of -- of using these cell lines to study ovarian cancer pathogenesis.

And my question is, is there a citation on your reference or materials cited -- materials considered list that we could refer to to help?

MS. SHARKO: Object. Object to the form.

THE WITNESS: I don't think I would have any trouble convincing anybody who is logical that studying a fully transformed lung cancer cell is not relevant to studying a normal fallopian tube cell.

I think that stems from elemental logic and you don't really even have to have much scientific credentials to make that conclusion.

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BY DR. THOMPSON:

Q. So that opinion at least is based on logic, not peer-reviewed medical literature; is that correct?

A. That -- that --

MS. SHARKO: Object to the form. Misstates the testimony.

THE WITNESS: That opinion is based on 39 years of experience in the cancer biology field from its earliest days. And from the general understanding of cell biology, molecular biology, and cancer biology that I and many other scientists of my credibility and credentials would hold.

BY DR. THOMPSON:

Q. As far as referring me to a citation in your report or attachments, that would address this issue, you are not able to do that today?

MS. SHARKO: Objection. Asked and answered several times.

THE WITNESS: That's not a

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personal -- first of all, I heard that. And it's not a personal opinion.

That is a scientific opinion based on 39 years of research, and I don't think you will ever find a credible scientific expert in the field of cancer biology who would say that studying A-549 in cancer cells from the lung is relevant to understanding the pathogenesis of fallopian tube and/or ovarian cancer. It's simply irrelevant.

And, again, I can cite and did cite in my report the fact that high grade serous cancer is not categorized by KRAS mutations. These cells have KRAS mutations. Okay? I know that because we work with these cells in a different context.

BY DR. THOMPSON:

Q. So if there were a scientist that would give an opinion that there is

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relevance to studying the effects of talcum powder or some other potential carcinogen on cell lines other than normal tubal primary cell lines, would you automatically have a criticism of that particular scientist?

A. I would have to see the scientist's opinion in detail, but anybody who -- anybody with training in modern cancer biology and with an understanding that A-549 cells are lung epithelial, the adenocarcinoma cells that bear a KRAS mutation, and anyone who knew about the pathogenesis of high grade serous ovarian cancer would realize that that's not a relevant cell system.

I would expect a first year graduate student to know that, frankly, and even a good undergraduate.

Q. There are certain carcinogen that cause cancer in many different tissues and different types of cancer, aren't there?

A. There are some carcinogens

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that have the capacity to damage DNA in many types of tissues, yes.
Q. And an example would be asbestos, would it not?
A. As I said, I haven't really exhaustively looked at the literature for asbestos and cancer. But the only, you know, thing that I know for sure is that asbestos causes mesothelioma and is a cocarcinogen with tobacco smoke for lung cancer.
Q. So you are not aware of other organs in which asbestos has been shown to cause cancer as well?
A. I just said it's a cause of mesothelioma. And it's a cocarcinogen with tobacco smoke for lung epithelial cancer. And there's some evidence it may also cause lung epithelial cancer.
Q. And you have the IARC 2012 monograph on asbestos. Can you identify the other types of cancer that IARC concluded were caused by asbestos in addition to mesothelioma?

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A. I --
MS. SHARKO: Object to the form.
THE WITNESS: I said that I haven't really studied the IARC monograph, so I can't comment on that.
BY DR. THOMPSON:
Q. And would anyone who relies on studies looking at the cell lines that you've been discussing, that you deem irrelevant, would they be wrong for doing so?
A. I didn't say that the cell lines were irrelevant. I said the cell lines were irrelevant to the question at hand.
These cell lines are highly relevant to understanding lung cancer pathogenesis. But they are not relevant to understanding ovarian cancer pathogenesis.
Q. Okay. Sir --
A. And these cells are fully

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developed cancer cells.
The question at hand, as I understand the question, is does talc contribute to the cause of ovarian cancer. Once you have a fully -- fully transformed lung cancer cell, it's a cancer.
Q. But we have discussed earlier that at least part of the carcinogenic process includes promotion and -- and progression of the cancer, correct?
A. This cancer is a fully developed, fully formed cancer. It's gone way behind the progression and initiation stages. This cancer will kill a mouse if you inject it into a mouse. It's not -- it's not a precancerous lesion. It's not a cancer -- it's not a lesion that it is in the process of carcinogenesis. It's fully blown lung cancer cell line derived probably from a metastatic lung cancer patient who underwent surgery. So it -- it's really

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not relevant in my opinion.
Q. Okay.
(Document marked for identification as Exhibit Neel-33.)
BY DR. THOMPSON:
Q. I'm going to give you another paper by the -- at least Akhtar is the same.
This is Exhibit 33, Akhtar, "Cytotoxicity and apoptosis induction by nanoscale talc particles."
Have you seen this paper, Dr. Neel?
A. 70 and 71, that must be --
Q. Oh, that's the --
A. Let me see if that's the paper that I cited. It's --
MS. SHARKO: Yes.
THE WITNESS: Yeah, I've seen this paper. I refer to it in my report. It's in the context of the same issues that we just discussed.

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BY DR. THOMPSON:
Q. And are your criticisms of this paper similar to the other Akhtar paper?
A. Yes, it -- yes, again uses a single lung cancer cell line which is fully transformed and bears KRAS mutations and, therefore, is not relevant to nontransformed fallopian tube epithelium or ovarian surface epithelium. Nor is it relevant to serous cancer pathogenesis because serous cancers almost never have KRAS mutations, and when they do have KRAS mutation, they are a later stage of development and are not involved in the initial stages of cancer.
That is well established from modern molecular biology research.
Q. And this paper was peer reviewed and published, correct?
A. I assume so. What journal is this? I don't even know what journal -- I assume it was.
Q. And the authors at least

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concluded that the particles that they used which were commercial -- indigenous and commercial nano talc particles, right?
A. That is what they say, yes.
Q. Okay. And the authors at least conclude that the particles significantly induced cytotoxicity, oxidative stress and apoptosis in human lung epithelial cells?
A. Well, first of all, they are not human lung epithelial cells. As I said that's a misstatement. They are human lung cancer cells.
So the title is misleading. And that conclusion is misleading.
Human lung epithelial cells can -- would normally be interpreted as, say, normal human lung epithelial cells. So these are human lung cancer cells. That would be a more accurate statement.
Q. Do you have other criticisms of the -- this paper?
A. The criticisms that I have

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of this paper are pretty much the same as the criticisms I have with the other Akhtar paper. Irrelevant cell line, uncertain dose. You know, no demonstration. We -- they couldn't actually demonstrate carcinogenesis here because they start with a cancer.
Q. Would you say that all four of these molecular studies relating to talc are flawed in some way?
A. I only count two.
MS. SHARKO: Object. Object to the form.
THE WITNESS: We're only discussing two.
BY DR. THOMPSON:
Q. Oh, I'm including Buz'Zard and Shukla.
A. Oh yes, they are all completely flawed from the standpoint of the question at hand, yes. They are not even close to being on point in my opinion, professional opinion, based on 39 years of research in cancer biology

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dating from the -- from the earliest days of the field and staying current in modern molecular biology research.
DR. THOMPSON: Would this be a good time for a break?
MS. SHARKO: Again?
DR. THOMPSON: How long has it been?
MS. O'DELL: A little over an hour. I think it's an appropriate time for a break.
THE VIDEOGRAPHER: Remove your microphones. The time is 5:03 p.m. Off the record.
(Short break.)
THE VIDEOGRAPHER: Okay. We are back on the record. The time is 5:24 p.m.
BY DR. THOMPSON:
Q. Dr. Neel, we've looked at five molecular studies this afternoon. That paper by Saed, by Shukla, Buz'Zard, and two by Akhtar.
Is it your opinion that all

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five of those studies are flawed?
A. They are either flawed or they are not relevant.
Q. And the -- the reason for that criticism seems to be primarily that there is no established dose and that the wrong cell lines are used. Is that a fair statement?
A. That is --
MS. SHARKO: Object to the form.
THE WITNESS: That statement refers to some of the papers. But Dr. Saed's paper is flawed on multiple levels, most notably his claim that talc applied to ovarian cells or fallopian tube cells can produce a stoichiometric shift in nucleotide sequence for a specific gene. That is just an incredible assertion.
So -- and also his claims that redox balance is disrupted in the cells without any measurement

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of redox balance in the cells. You can't make that claim without actually measuring redox balance.
So his paper, the -- the one that's in -- that just was published apparently is flawed conceptually and technically.
The other papers are using questionable doses and irrelevant cell systems. So they're different objections to the different studies.
BY DR. THOMPSON:
Q. So is it your opinion that any scientist who relies on these studies would be using -- relying on these studies to answer the question of whether talcum powder causes ovarian cancer, would be using bad scientific judgment?
MS. SHARKO: Object to the form of the question.
THE WITNESS: What -- what would -- can you repeat the question?

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BY DR. THOMPSON:
Q. Sure.
A. She distracted me. Sorry.
Q. So --
MS. SHARKO: Sorry, that was not my intention.
BY DR. THOMPSON:
Q. So is it your opinion that any scientist who relied on those studies to formulate their opinions as to whether talcum powder use could cause ovarian cancer, would be using poor judgment from a scientific standpoint?
A. Yes. I would have to say that.
Q. And would it be your opinion that any scientist who relied on those studies to answer the question of whether talcum powder use could cause ovarian cancer, would not have a sufficient understanding of molecular and cellular biology?
A. If that's the basis for their opinion, then they are not -- yes,

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that would be my opinion.
Q. Would -- would you look at your CV which is exhibit -- something not very high.
A. Yes. I have it.
Q. Okay. And before we get to your CV, was -- would it be your opinion that any scientist who relies on these studies for opinions on the biological plausibility of talcum powder use causing ovarian cancer to be using poor scientific judgment?
MS. SHARKO: I object to the form of the question. Can you break it down by study?
MS. O'DELL: No.
THE WITNESS: So if the -- if the only studies that they used to reach the opinion that talc caused ovarian cancer were these five highly flawed studies, they would be exercising poor scientific judgment in my opinion.
BY DR. THOMPSON:

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Q. Even on biological plausibility?
A. Oh, for sure, yes. I don't think these -- these papers are credible assessments of biologic plausibility at all in any way.
Q. And if the scientists who rely on these studies for their opinions regarding the biological plausibility of talcum powder use causing ovarian cancer would also not have a sufficient understanding of molecular cellular biology?
MS. SHARKO: Object to the form of the question.
THE WITNESS: I -- I think that it would depend on what -- they might have an understanding of some aspects of cell and molecular biology. But they would not have any understanding of other aspects of cellular and molecular biology. So that's a very difficult question to answer.

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If you ask a more specific question, I can help you with an answer.
BY DR. THOMPSON:
Q. But at least the opinions relating to the biological plausibility for that, to answer that question, their understanding in your opinion would be inadequate?
A. I think that someone who read these papers and thought that they provided plausibility for the contention that talc causes ovarian cancer would have poor scientific judgment as to that question, yes.
Q. Let's go ahead and look at your CV now.
A. Sure.
Q. And we'll do the same thing we did before. So using your criteria of an established dose, an appropriate cell line, are there any of your publications that you think are relevant to the question as to whether talcum powder

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products can cause ovarian cancer?
A. No. As I've said before, I haven't studied that issue and I wouldn't be able to study that issue in my current position.
Q. Okay. Have you ever published in Gynecologic Oncology, to your knowledge?
A. I may have been a co-author on a paper in Gynecologic Oncology. But I have not been a senior author on any paper in Gynecologic Oncology.
Q. Should any study that treats ovarian cancer as a single entity be used with skepticism?
A. I think today, yes.
Q. Is this because ovarian cancer is not a single disease?
A. Yes.
Q. But isn't hormone -- hormone responsiveness a common link among all ovarian cancer subtypes?
A. Hormone responsive -- the endometrioid and clear cell cases are

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much more clearer about hormone responsiveness. Whether serous cancers are hormone responsive probably -- it depends on the cancer.
So -- and whether it's involved in pathogenesis is also not as well established.
Q. But at least some scientists would argue that hormone responsiveness would be one of those factors that could cross all histologic subtypes?
A. Again, I can't comment on specific -- on general statements like some scientists. If you give me a specific statement that was made by a specific scientist, I can look at it and I can determine whether I agree with it or not or whether I think it's credible.
Q. Has it been published that hormone responsiveness would be a factor that would cross all subtypes to your knowledge?
A. There have been -- there -- there have been reports that hormone

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replacement therapy may be oncogenic, you know, procarcinogenic in ovarian cancer.
Q. And that includes all subtypes?
A. Well, the effects are much stronger for, as I said clear cell and endometrial cancers. And whether it's true for high grade serous is less clear, from my -- from my recollection of the literature.
Q. Could a reasonable scientist discuss ovarian breast cancer and endometriosis as a group because they are all hormonally responsive lesions?
MS. SHARKO: Object to the form of the question.
THE WITNESS: Discuss in what context? I don't understand the question.
MS. SHARKO: You can ask them to read their handwriting.
BY DR. THOMPSON:
Q. If you were looking at in vitro studies, would it be appropriate to

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use either serous breast or endometrioid cancer cell lines and extrapolate the information from one to the other?
A. What's the question? Not what's your question, but what's the scientific question that's being asked? I mean, if you want to just look at hormone responsive gene expression, then maybe. If the question is having to do with the pathogenesis of each of the individual diseases, then probably not.
It would depend on the specifics though. Scientists don't think that way. They think in very specific terms so they can frame accurate questions that can yield results that are interpretable. So I can't answer a question that's so generic and nonspecific as that.
Q. Can chronic inflammation induce a proliferation of tubal epithelium?
A. I don't know the answer to that question.

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Q. Has that been studied?
A. I don't know the answer to that question, so I would be uncomfortable answering it.
Q. Could a reasonable scientist make that statement?
A. I don't know. I'd have to see the paper. I'm happy to look at the paper and go over the data if there is such a paper.
Q. Could inflammation-induced proliferation in the tubal epithelium, in the epithelial, if that did occur, progress to papillary tubal hyperplasia?
A. What do you mean by papillary tubal hyperplasia? Do you mean STICs?
Q. Let's say STICs.
A. I don't know. I'd have to -- I'd have to see the study. I'm not going to speculate on mechanisms that I haven't seen in the -- in the press -- in the scientific press.
Q. In addition to the Saed

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papers that you did not list in the materials considered or the supplemental materials, are there any other papers that were -- that form the basis of your criticisms of either the Saed or the other molecular papers?
MS. SHARKO: Object to the form of the question. Lacks foundation.
THE WITNESS: I think you misunderstood or maybe I was unclear before.
My opinion of the Saed paper that was just published is based on the Saed paper that was just published.
And that doesn't need me to read any of his earlier papers.
My comments about some of his earlier papers had -- went to the issue of erroneous statements that were made in his report. Having to do, for example, with the expression of myeloperoxidase

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and ovarian cancer cells, having to do with the statement that p53 is an oncogene, whereas it's a paradigmatic tumor suppressor gene, having to do with statements regarding SNPs that are not in the GWAS catalogue of well-recognized ovarian cancer SNPs.

But that had nothing to do with my criticisms of his paper, which stand independent of any other issues regarding Dr. Saed's qualifications or expertise.

DR. THOMPSON: Object as nonresponsive.

BY DR. THOMPSON:

Q. Because my question was really only, are there any other papers or literature that form the basis?

A. With respect, DR. THOMPSON, the question that you asked me, as I understand it, and you're welcome to read it back to me, but I believe your question was, were there any other papers

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that led to my objection to his, you know, paper in Reproductive Biology.

And the answer to that is none of those other papers are directly relevant to the paper in Reproductive Biology. The errors in the paper of Reproductive Biology stand on their own and are clearly determinable by anyone with expertise in modern cellular and molecular biology.

MS. SHARKO: Okay. I think it's late. I think she's just asking you if there are any papers that you're relying on that aren't listed in the report and reliance materials.

THE WITNESS: No.

BY DR. THOMPSON:

Q. And Ms. Sharko is correct. That was the question that I was trying to ask.

A. Okay. And that question is no.

Q. And I'm just going to

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clarify, were there -- the papers that you considered informing those opinions regarding Dr. Saed that you have not mentioned so far?

A. No.

Q. Okay. Have you sent any comments to Health Canada?

A. No.

Q. Do you plan to send any comments to Health Canada?

A. I don't know if it's appropriate for me to send any comments to Health Canada while I'm involved in this litigation. I would have to consult Ms. Sharko and Mr. Zellers as to whether I should.

Q. You'll agree that talc and its potential contribution to ovarian cancer has been an issue for several decades. Would you agree with that, in the literature?

A. It's certainly been in the epidemiological literature. In the biology literature, there's actually

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relatively limited studies, which is why we've been actually able to cover most of them in this last hour or two.

Q. And that would be for talc, but certainly there have been studies regarding the molecular basis for asbestos and it's carcinogenic potential, correct?

A. As I said, I haven't done an exhaustive study of what's in the literature about asbestos and its role in ovarian cancer. I think you asked me about talc, which is what I answered.

Q. I asked you about talcum powder. Or I meant to ask about talcum powder.

A. Yes. And I answered that.

Q. Have you ever been asked to do an in vitro study with talcum powder?

A. No.

Q. Have you ever been asked to do an in vivo study with talcum powder?

A. No.

Q. And could you do either an

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in vitro study or an in vivo study to evaluate the causal connection between talcum powder or the potential causal connection between talcum powder and ovarian cancer?

A. Not in my --

MS. SHARKO: Objection. Asked and answered a zillion times.

THE WITNESS: I'll -- that's --

BY DR. THOMPSON:

Q. This question -- sorry. This question is outside the context of your current situation.

Could you do that study?

A. Could I do the study? I would have to really seriously think about the problem and then decide whether I could do a good study. There would be several problems, many of which I've already described, having to do with coming to arrive at a reasonable dose. I probably could test a range of doses in a

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biologically relevant system than, for example, any of the five papers that we discussed extensively in the last two hours did.

Q. So at least today, sitting here, you're not sure whether you could do the quality study that would be required or not; is that fair?

MS. SHARKO: Object to the form.

THE WITNESS: I'm saying that it's not clear that enough information is available to design a study, not that I couldn't do it. I could certainly do it if a reasonable -- if there were clear information about a dose range of talc that was in -- if there were talc in fallopian tube and/or there were talc in ovarian adnexa -- in the adnexa -- in the ovarian surface endothelium or region, I could do a reasonable study using those doses of talc

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and more physiologically relevant systems than, for example, Dr. Saed did, and certainly the other four papers which were off point in my opinion.

DR. THOMPSON: I have no further questions.

MS. SHARKO: Okay. We're done. Thank you very much.

THE WITNESS: Thank you.

THE VIDEOGRAPHER: Okay. Stand by, please. This marks the end of today's deposition. The time is 5:42 p.m.

(Excused.)

(Deposition concluded at approximately 5:42 p.m.)

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CERTIFICATE

I HEREBY CERTIFY that the witness was duly sworn by me and that the deposition is a true record of the testimony given by the witness.

It was requested before completion of the deposition that the witness, BENJAMIN G. NEEL, M.D., Ph.D., have the opportunity to read and sign the deposition transcript.

_____

MICHELLE L. GRAY,
A Registered Professional Reporter, Certified Shorthand Reporter, Certified Realtime Reporter and Notary Public
Dated: March 20, 2019

(The foregoing certification of this transcript does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.)

INSTRUCTIONS TO WITNESS

Please read your deposition over carefully and make any necessary corrections. You should state the reason in the appropriate space on the errata sheet for any corrections that are made.

After doing so, please sign the errata sheet and date it.

You are signing same subject to the changes you have noted on the errata sheet, which will be attached to your deposition.

It is imperative that you return the original errata sheet to the deposing attorney within thirty (30) days of receipt of the deposition transcript by you. If you fail to do so, the deposition transcript may be deemed to be accurate and may be used in court.

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ACKNOWLEDGMENT OF DEPONENT

I,_____, do hereby certify that I have read the foregoing pages, 1 - 445, and that the same is a correct transcription of the answers given by me to the questions therein propounded, except for the corrections or changes in form or substance, if any, noted in the attached Errata Sheet.

_____

BENJAMIN G. NEEL, M.D., Ph.D. DATE

Subscribed and sworn to before me this _____ day of _____, 20____.

My commission expires:_____

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Notary Public

LAWYER'S NOTES

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